Challenge TB - Tanzania

Year 2

Annual Report

October 1, 2015 – September 30, 2016

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Cover photo: An MDR-TB patient on initial phase of treatment at the Kibong'oto Infectious Diseases Hospital in Kilimanjaro, Tanzania (Photo credit: Dr Ladislaus Ritte, KIDH)

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Table of Contents

List of Figures

List of Abbreviations and Acronyms

ACSM	Advocacy, Communication and Social Mobilization
ATS	American Thoracic Society
CTB	Challenge TB
CTC	Care and Treatment Clinic [for HIV care and treatment services]
CTRL	Central Tuberculosis Reference Laboratory
CHMT	Council Health Management Team
DTLC	District Tuberculosis and Leprosy Coordinator
EQA	External Quality Assurance
ERR	Electronic Recording and Reporting
GF	Global Fund
HCW	Health Care Worker
HIV	Human Immunodeficiency Virus
KIDH	Kibong'oto Infectious Disease Hospital
MoHCDGEC	Ministry of Health Community Development, Gender, Elderly and Children
MDR	Multidrug Resistant
MUHAS	Muhimbili University of Health and Allied Science
NTLP	National Tuberculosis and Leprosy Program
NIMR	National Institute of Medical Research
PEPFAR	President's Emergency Plan for AIDS Relief
PMDT	Programmatic Management of Drug Resistant Tuberculosis
PATH	Program for Appropriate Technology in Health
PLHIV	People living with HIV
RTLC	Regional Tuberculosis and Leprosy Coordinator
TB	Tuberculosis
ToR	Terms of Reference
TWG	Technical Working Group
USAID	Unites States Agency for International Development
WHO	World Health Organization
ZITHLP	Zanzibar Integrated Tuberculosis, HIV and Leprosy Program

1. Executive Summary

It is estimated that Tanzania has a Tuberculosis (TB) prevalence of 528 (215–979) per 100,000 population and incidence of 306 (146-525) per 100, 000 population with a case detection of only 37%. The country is listed among countries on the TB high burden country list that will be used by WHO 2016 -2020. MDR TB is estimated to account for 1.3% and 4.7% of the new and retreatment cases, respectively (Global report, 2016).

The Challenge TB Project (CTB) in Tanzania is implemented by KNCV as the lead partner with two collaborating partners, the American Thoracic Society (ATS) and PATH. The project focuses on nine sub-objectives: (1) Enabling environment; (2) Comprehensive, high-quality diagnostics; (3) Patient-centered care and treatment; (4) Targeted screening for active TB; (5) Infection control; (6) Political commitment and leadership; (7) Comprehensive partnerships and informed community involvement; (8) Quality data surveillance and M&E; and (9) Human resource development. The end-of-the-project achievements include:

- Improved access to quality patient-centered care for TB, TB/HIV, and MDR-TB services in CTB priority regions
- Scale-up of interventions to prevent transmission and disease progression in CTB priority regions
- Strengthened leadership and management by NTLP

CTB has 23 staff, 3 seconded from PATH and 3 seconded to the Central TB Reference Laboratory (CTRL). The project is being implemented in 7 USAID priority regions of Arusha, Dar es Salaam, Geita, Kilimanjaro, Mwanza, Pwani and Zanzibar (Unguja and Pemba).

In collaboration with the National TB and Leprosy Program (NTLP) at the national, regional and district levels CTB Tanzania managed to achieve the following in APA2:

- Supportive supervision and mentoring has improved program performance. Pediatric TB case notification increased from 9.3% of all notified cases in Q1 (Oct-Dec 2015) to 11% and 10% in the last two quarters. Out of 24,515 notified TB cases during the year, 24,173(99%) were tested for HIV compared to the national target of 100%, with a TB/HIV co-infection rate of 32.2%. About 98.5% (7,825/7,914) and 93% (7,433/7,914) of the co-infected patients were started on CPT and ART respectively. A total of 5,312(21.6%) TB cases were notified through intensified case finding (ICF) among PLHIV.

- In order to increase TB case detection at the community level, CTB facilitated Advocacy Communication and Social Mobilization (ACSM) and community TB care trainings (including contact investigation). We trained a total of 117 regional and district TB/HIV coordinators, health care workers (HCWs), ex-TB patients, traditional healers, drug dispensers from private pharmacies, and community volunteers from three priority districts in the CTB regions of Arusha, Dar es Salaam and Geita. As a result of community-based activities, CTB reached approximately3,000 community members with education in 5 districts, 1,338 were screened referred 722 people with TB symptoms to facilities for evaluation, out of whom 33 people with TB were diagnosed. Of these 7 were diagnosed by Gene Xpert, 13 Smear microscopy, 12 xray, 1 score chart. Of 33 TB diagnosed, 32 started treatment and 1 patient did not turn up for results.

- CTB continued to support the CTRL towards achieving accreditation that started in APA1. The laboratory team, which includes KNCV's Safety Officer, Quality Officer and EQA Technical Officer with guidance from an external consultant, worked on gaps identified in assessment done in APA1. In-house training of laboratory staff on Quality Management, improvement of documentation, use of Standard Operating Procedures (SOP) and reorganization of the laboratory for improved workflow as well as renovation with CTB support earned the laboratory SLMPTA three stars of 5 stars compared to two stars in the previous assessment in February 2015.
- CTB together with the NTLP updated different programmatic documents needed to facilitate implementation of TB, and TB/HIV activities, these include; The national TB/HIV policy, which guides implementation of HIV/AIDS management guidelines; The comprehensive supportive supervision and mentorship training package for TB/HIV; The TB – Diabetes management guidelines; and the pediatric TB guidelines.
- Out of 7,546 HCWs screened for TB, 33 (0.44%) were diagnosed to have TB and initiated on treatment. As a result of this initiative, the Ministry of Health thought NTLP, agreed to revise the country's TB workplace policy and address HCWs. CTB has proposed to support the revision of this policy in APA3.
- CTB supported the NTLP to decentralize PMDT services from Kibong'oto Infectious Diseases Hospital (KIDH) the only hospital in the country that provided initial phase of PMDT services. New initiation sites were trained and mentored using training materials developed with CTB support. Regions that have initiated newly diagnosed MDR TB patients include Dar es Salaam (4 sites), Geita, Kagera and Mtwara. In quarter 4, 24 (54%) patients out of total 44 were initiated treatment in decentralized units (out of Kibong'oto). With decentralization, access to prompt treatment initiation has accelerated.

2. Introduction

The Challenge TB project in Tanzania has completed its second year of implementation that commenced in March 2015 with KNCV Tuberculosis Foundation being the lead partner in collaboration with PATH and the American Thoracic Society (ATS) as partners. PATH has been providing technical assistance in community and TB HIV related activities with a Community Engagement Technical Officer, a Capacity Building Technical Officer and a TB/HIV Technical Officer. ATS has been supporting PMDT cohort review process including adaptation of cohort tools to the ongoing decentralization as well as providing input on the TB electronic recording and reporting system that is being developed. The buy in amount for APA 2 was USD 2,476,625 out of which USD 786,917 was PEPFAR funds.

In collaboration with the National Tuberculosis and Leprosy Program (NTLP), the project aims to address the following challenges over the course of 5 years.

- Low case detection
- Limited access to patient-centered care and treatment
- Limited interventions on prevention of transmission and disease progression
- Weakened national leadership and program management

Currently, CTB priority regions are in Arusha, Dar es Salaam, Geita, Kilimanjaro, Mwanza, Pwani and Zanzibar with an estimated total population of 14,373,097 people (2012 census). The CTB project supports provision of DR-TB services country-wide.

The project's strategy is focused on the following approaches: introduction of new interventions with a high and demonstrable impact, support for policy development and updating of training curricula and guidelines in line with current WHO recommendations, providing leadership and support for technical working groups at national level, overseeing implementation of region-specific approaches in USAID priority regions and scale-down technical dependence of NTLP on Challenge TB technical assistance over the course of the project though capacity- building at different levels of the health system. In addition, CTB will support large (capital) investments of the Global Fund to the NTLP, support establishment of a national electronic data reporting system; coordinate closely with all stakeholders supporting HIV activities in the scale-up of TB/HIV collaborative activities.

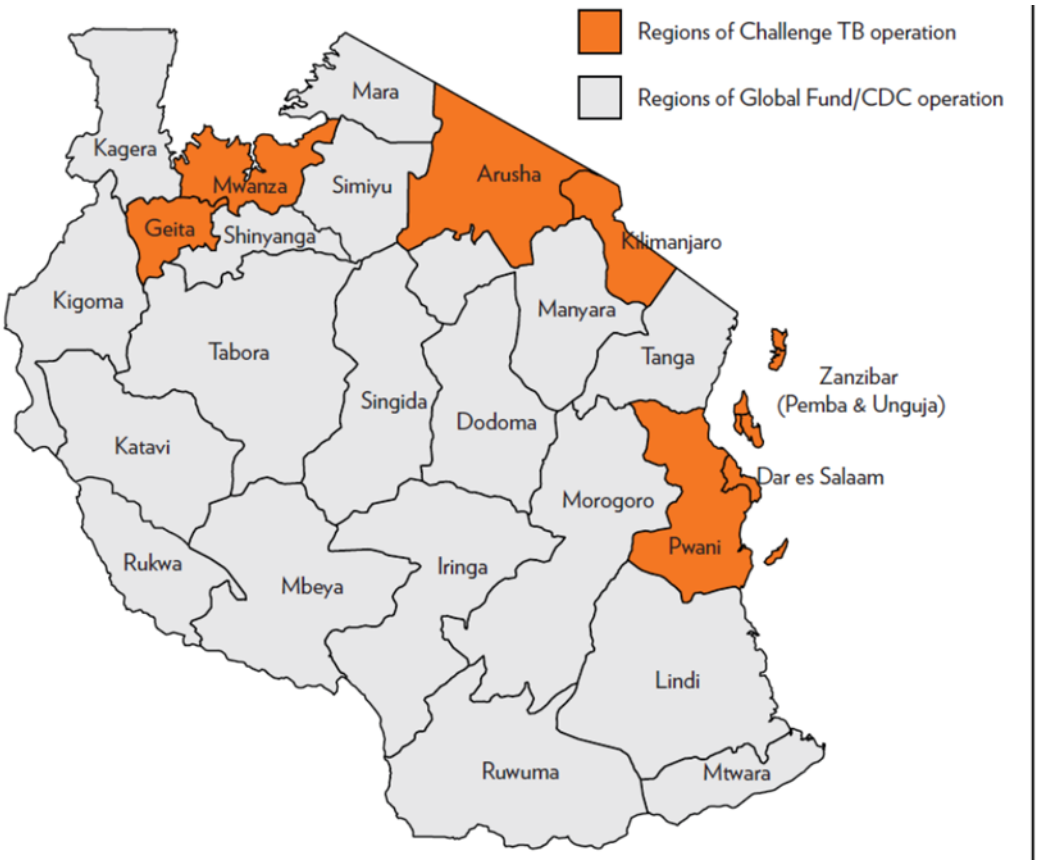

Figure 1: Tanzania with Challenge TB and Global Fund/CDC regional geographic coverage

3. Country Achievements by Objective/Sub-Objective

Objective 1. Improved Access

Sub-objective 1. Enabling environment

In order to improve access by creating an enabling environment and demand creation CTB collaborated with the NTLP to strengthen targeted behavior change and communication strategies among key populations. Focus was on the Advocacy, Communication and Social Mobilization (ACSM) Strategy, assessment of quality of TB services to inform the patient-centered approach and to create demand for TB services through engagement of community-based organizations.

Key Results

1. ACSM activities

The NTLP in collaboration with CTB and various implementing partners, reviewed the National Advocacy, Communication and Social Mobilization Strategy and implementation plan for TB and Leprosy Program (2015/2020) to align with the NTLP strategic plan of 2015-2020 and the End TB Strategy. ACSM training packages for health care workers

(HCWs) and community health care workers (CHCWs) were developed in both English and Kiswahili languages. The package includes a facilitator's guide, participant's manual and course workbook and slides. These materials have been used to train 15 regional and district coordinators during pre-testing, following approval by the Ministry and NTLP also trained 102 (46 males and 56 females) participants consisting of regional and district TB and HIV coordinators, health care workers (HCWs), ex-TB patients, traditional healers, drug dispensers from private pharmacies, and community volunteers from three districts of Meru, Kinondoni and Geita in CTB regions. The primary goal of the workshop was to build knowledge among HCWs and CHCWs to understand ACSM concepts and to build skills to plan ACSM activities in support of community TB, TB/HIV and DR-TB control. District teams developed ACSM action plans for implementation to move ACSM activities forward and to integrate them into existing TB control activities in their areas. Among proposed activities were provision of health education, community sensitization on TB, TB/HIV and DR-TB, conducting targeted TB screening among key population groups in the community, conduct contact investigation to contacts of bacteriologically confirmed TB and DR-TB cases, support transportation of sputum to diagnostic centers, provide referral of presumptive TB case to diagnostic facility and advocate for TB activities at the community level. It is expected that the contribution of cases notified from the community will increase because of increased awareness.

Figure 2: ACSM training in Meru District, Arusha (Photo credit: Rose Olotu, Community Engagement Technical Officer)

2. Quote TB light assessment

CTB conducted the Quote TB Light assessment in three districts namely Ukerewe, Arusha and Ilala. This is a quality improvement initiative aimed at assessing patients' perspectives of TB services based on nine quality dimensions: communication and information, professional competence, availability of TB services, affordability, patient provider interaction and counselling, support (transportation, food, and money), TB/HIV relationship, infrastructure, and stigma. In-depth interviews and focus group discussions were conducted with TB patients currently on treatment. Respondents ranked professional competence as the most important dimension of TB Care followed by availability of TB services; stigma was identified as the least important dimension. Information on drugs' side effects, sputum examinations, availability of clean drinking water, and quality laboratory services were also of importance. Results of this assessment have been shared with stakeholders including patients who were involved in the assessment. Action plans for quality improvement include inclusion of rotating staff at TB clinics in TB/HIV trainings and mentorship, interpersonal skills training, contact investigation and scaling up of DOT sites to be nearer to where patients reside and improvement of clinic infrastructure. CTB will support mentorship and contact investigation activities while the district authorities committed themselves to scaling up of DOT sites and improvement of infrastructure.

Figure 3: Focus group discussion with TB patients during QUOTE Light assessment in Arusha District Council (Photo credit: Rose Olotu, Community Engagement Technical Officer

3. Development of IEC materials targeting key affected populations

CTB supported the NTLP in developing informational behavior change materials to promote and reinforce positive behavior change messages towards elimination of TB. Key affected populations targeted include: miners, people living with diabetes, PLHIV, health care workers, children, elderly, and PWIDs. The materials include posters, leaflets and audio recordings, they provide information on; signs and symptoms of TB, when to seek care, relationship between HIV, diabetes, drug use, mining and TB, TB treatment and stigma in relation to TB among HCWs. Distribution of these materials will be done in CTB and non-CTB regions where they will help HCWs and CHCWs including CBOs as they work to increase knowledge about TB in the general population among people most at risk of infection.

4. Engagement of CSOs

To increase demand for TB services at the community level and consequently improve notification rates and treatment adherence CTB is in the process of engaging community-based organizations in three priority districts of Kinondoni in Dar es Salaam, Meru in Arusha and Geita District Council in Geita region.

CBOs were selected after mapping of CBOs in priority districts with large numbers of key affected populations (i.e., PLHIV, miners, people with diabetes), low case notification and availability of CBOs with experience with TB/HIV activities. CTB adopted an organizational capacity assessment (OCA) tool to guide assessment of the three selected CBOs to determine gaps or areas where strengthening is needed across various domains, i.e., governance, managerial processes, human resources, financial management, advocacy and networking, and infrastructure and assets. The main findings across the three CBOs assessed were significant weaknesses in financial management, managerial processes, and advocacy and networking capacities.

CTB Capacity Building Officer worked with each CBO to develop individualized organizational capacity strengthening plans tailored to build capacity in identified gap areas of prioritized domains. All three CBOs participated in tailored financial management trainings during this reporting period. One has been trained on TB issues which was one of the challenges prioritized, all 65 active volunteers participated in the training.

CTB is building both technical and organizational capacity of the CBOs for them to sustainably implement, monitor and report on targeted interventions to increase TB case notification. Activities that CBOs will engage in include; provision of health education, community sensitization on TB,TB/HIV and DR-TB, conducting targeted TB screening among key populations in the community, sensitize community on TB,TB/HIV and DR-TB, conduct contact investigation to close contacts of bacteriologically confirmed TB and DR-TB cases, support transportation of sputum to diagnostic centers, provide referral of presumptive TB case to diagnostic facility and advocate for TB activities at the community level.

Figure 4: CBO members participating in group discussions during financial management training *(Photo credit: Eunice Moturi, Capacity-building Technical Officer CTB/PATH)*

5. Communication enhanced by integration of m-Health in community education activities

CTB/PATH conducted desk research and informational interviews with organizations and stakeholders which have implemented m-Health initiatives in the country to inform the concept development and prepare for application and implementation of TB related m-Health solutions.
Findings from the desk review were that sms/voice messages for self-screening may be effective. Key lessons learnt included: Early involvement of all key stakeholders is very important, integration of TB self-screening mobile application and referral services into existing community structures, using the community health workers as ambassadors, enabled fast start-up and acceptance of the project into the community and that this approach delivers TB screening services directly to the households of clients, thus ensuring access to TB screening services without barriers of direct and opportunity costs to the client. Mobile data collection platforms can play a vital role in improving routine programmatic functions; m-Health has the potential to improve primary level services with high patient numbers and overburdened staff; one step in the right direction to help improve early detection of illness, which will prevent deaths.

CTB will build on these lessons learned and integrate an improved application into CTB's community-level efforts to help find the missing TB cases. In APA3, CTB envisions supporting the development of a TB specific m-Health strategy which will guide all e-Health related activities in TB care and prevention. CTB also plans to introduce a mobile phone based application which will aim at increasing awareness, increase early health seeking behavior through a TB self-screening application, and support adherence to

treatment by sending mobile short message services reminders to remind patients to take their medications.
This m-Health tool will also send targeted messages to enrolled TB patients based on where the individual is in their care and treatment regimen to remind them of appointments, the importance of treatment adherence, and other health messaging related to TB and health behavior.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y2
1.2.4	TANZANIA SPECIFIC: # of districts where ACSM strategy is implemented.		0 (June 2015)	3	3
1.4.2	Number of health facilities where quality of services was measured	Description: NTP should measure the patient perception of the quality of services available/ accessible and the appropriate health seeking behavior related to TB. Available tools for this purpose are TB CAP's QUOTE TB and QUOTE TB Light tools. However, any other tools could be used to measure it. Count the number of facilities where quality of services from a patient's perspective was measured using QUOTE or any other tool in the last 12 months. Indicator Value: Number Level: National or Challenge TB geographic areas	TBD (Dec 2015)	15	15 facilities in 3 districts

Sub-objective 2. Comprehensive, high quality diagnostics

The project is working to support activities at national level in support of laboratory strategy and policy development, as well as support to the CTRL. Direct laboratory network support is given to capacity building, infection control and bio-safety, recording and reporting systems and linkages between diagnostics and clinical care as well as improved monitoring of data, EQA and feedback of results.

Key Results

Accreditation of the Central Tuberculosis Reference Laboratory (CTRL)

CTB is supporting the CTRL towards achieving ISO15189:2012 accreditation with technical assistance from an external consultant. The project has also seconded three staff at the CTRL i.e Safety Officer, Quality Officer and EQA Focal Person to address shortage of staff in order to improve Quality Management Systems and Good Laboratory Practices. CTB is in discussion with MoHCDGECto absorb the three staff for CTRL.

Technical assistance provided includes; assessment of the laboratory based on the QMS essentials of the GLI tool, in-house training of laboratory staff on Quality Management, improvement of documentation, use of Standard Operating Procedures (SOP) and reorganization of the laboratory for improved workflow. Reassessment of the laboratory in quarter two done by the East Africa Public Health Laboratory Network Program (EAPHLNP) resulted into CTRL achieving SLIMPTA 3 of 5 possible stars compared to an earlier assessment which received only 2 of 5 stars . In regard to improved QMS at the CTRL, KNCV through CTB Project has also supported the renovation to provide CTRL with a reception room for safety issues.This has been recommended by the assessors and consultants in regard to accreditation process.

Figure 5: Newly renovated reception area where samples are received in the processing room with negative pressure (Photo credit: Hassan Mbega, KNCV EQA Technical Officer)

TB microscopy External Quality Assurance (EQA)

In line with the NTLP's efforts to improve EQA for direct smear microscopy performance in the country, CTB trained 44 laboratory staff and district coordinators from the 7 supported regions. CTB's EQA technical officer seconded at CTRL oversees improvements of smear microscopy, DST and Culture EQA systems country-wide using panel testing, on site supervision and blinded rechecking system. The national health laboratory's EQA coordinator oversees GeneXpert EQA countywide in collaboration with the GeneXpert focal person located at the CTRL. Out of 268/381 (70%) microscopy sites in CTB regions participated in the EQA program by the end of APA2 with 85% concordance results. This is an improvement from only 26% at the beginning of the year is because of training, supervision and review of EQA performances during quarterly performance review meetings. All six culture laboratories are implementing the laboratory Quality Management System while half are enrolled in the culture EQA system.

The CTRL is the only laboratory capable of performing DST and is enrolled in EQA for DST with the WHO/Afro NRL in South Africa. CTRL receive 5 panels twice a year, in June CTRL scored 97%. Challenges still encountered by the EQA system include; Poor participation of EQA and untimely submission of EQA reports from the regions; Low detection of positive/scanty samples at follow up, high false positives and quantification errors; Laboratories in many regions are not rechecked, and only a few slides are stored for rechecking. Quite a number of sites do not have errors detected despite the high workload, this shows either the sampling is not done according the LQAS protocol and randomly selected or that the controllers are not blinded. High turnover of staff in peripheral labs also contribute to poor EQA performance.

National Laboratory strategic plan

As part of CTBs support for Laboratory Strengthening in the country, with technical assistance from KNCV Head Quarters the National TB Laboratory Strategic Plan was developed together with indicators for monitoring implementation of TB laboratory activities. Major area of focus is decentralization of TB culture services to 5 zonal labs in order to reduce workload of CTRL and to acquire 90% coverage of smear microscopy with 95% concordance results countrywide. The Operational plan and budget will be developed in APA3 due to delayed approval of Strategic plan by the Ministry of Health.

Diagnostics/ Expansion of GeneXpert technology

CTB supported the NTLP to strengthen TB diagnosis and resistance testing by procurement and installation of 4 GeneXpert machines with training making a total of 6 CTB supported machines regions out of the 70 available in the country. Ten GeneXpert machines were linked to the GXAlert system; currently 60 out of the 70 machines are linked to the system that assists with remote monitoring of the performance of the machines and monitoring of stocks of cartridges in the country. Countrywide 68/70 (97%) of the machines are functional, 16/17 (94%) in CTB regions. Utilization of GeneXpert machines country wide was at less than 10%, reasons for under-utilization include: low demand from ordering clinicians and high work load

for laboratory staff that are also responsible for running other tests. To address this CTB is promoting sensitization of clinicians in order to increase their TB suspicion indexes.

In our efforts to enhance microscopy networks CTB procured and installed 10 LED microscopes and trained 20 lab personnel for CTB regions prioritizing districts with low TB case detection. In addition, CTB supported Kibong'oto Infectious Disease Hospital in procurement of HAIN (Line Probe Assay) reagents for TB diagnosis and resistance testing for both MDR and XDR presumptive cases. Additional 2nd line resistance testing is in line with the new WHO treatment guidelines classifying patients for short MDR treatment regimen or modified regimens that include new drugs.

National TB Laboratory Technical Working Group

CTB continued to support quarterly National TB Laboratory Technical Working Group meetings established in year 1. These meetings provide an avenue for different stakeholders in the country to present and discuss quarterly performance indicators, achievements, challenges, and recommendations. The meetings ensures that action points are established to address and overcome challenges. Challenges addressed during the year include: (1) maintenance plans for specialized equipment in TB Zonal Culture Laboratories; (2) supply chain management for zonal TB laboratories; (3) targeted supportive supervision for TB focal persons in respective zones; (4) culture and DST EQA systems for zonal TB laboratories; (5) flow of TB specimens sent for culture and DST at CTRL; and (6) zonal TB laboratories and awareness of DTLCs on the role and capacity of TB zonal laboratories in performing TB cultures.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y2
2.1.2	A current national TB laboratory operational plan exists and is used to prioritize, plan and implement interventions.	Description: This indicator measures whether or not a country has a defined TB laboratory operational plan (work plan) within the larger National TB Strategic Plan or National Laboratory Strategic Plan. The country and partners use the operational plan to design and implement priority activities to strengthen TB diagnostic services and the network for TB control. Indicator Value: Score based on the following: 0= Operational plan not available 1= Operational plan available 2= Operational plan available and follows standard technical and management principles of a quality work plan required for	0(2015)	1	0 (the LSP is completed awaiting endorsement by the Ministry of Health)

		implementing the necessary interventions to build and strengthen the existing TB laboratory network (reference: "Practical Handbook for National TB Laboratory Strategic Plan Development"; http://www.stoptb.org/wg/gli/assets/documents/Lab_Strategic_Handbook.pdf) 3= Operational plan available and meets annual implementation targets			
2.2.6	Number and percent of TB reference laboratories (national and intermediate) within the country implementing a TB-specific quality improvement program i.e. Laboratory Quality Management System (LQMS).	Description: This indicator measures the percentage of TB reference laboratories in the country that are implementing a quality management system for continuous improvement of all aspects of laboratory operations to assure accuracy and reliability of testing, disaggregated by national and intermediate levels. Provide a score/rating for every reference laboratory implementing LQMS, either the "GLI Stepwise Process towards TB Laboratory Accreditation" (scoring = phase 1-4) or SLIPTA/SLMTA for TB (scoring=stars 1-5). Indicator value: Number and percent (Reference: Laboratory Quality Management Systems Handbook; http://www.who.int/ihr/publications/ lqms/en/) Numerator: Number of TB reference laboratories implementing a quality improvement program Denominator: Total number of TB reference laboratories in the	0/6 (0%) (2015)	6/6 (1000%)	6/6 (100%) CTRL SLMTA star 3, Bugando star 3, Mbeya star 4, Dodoma star 2, KIDH star 2, Pemba star 2

		country Level: National and/or Intermediate			
2.2.7	Number of GLI-approved TB microscopy network standards met	Description: This indicator measures whether or not a country has met the 11 GLI-approved standards for the TB microscopy network. A CTB checklist is provided to assess fulfilment of the requirements for each standard. Identify numerically (1-11) which standard(s) have been met. Indicator value: Number Numerator: Total number of standards met (NE=not evaluated, 0=no standards have been met).	3 (2015)	5	3/11 (2, 6, 8) targets could not be met due to delayed LSP, low number of lab staff and infrastructural issues
2.3.1	Percent of bacteriologically confirmed TB cases who are tested for drug resistance with a recorded result.	Description: This indicator measures the percentage of bacteriologically confirmed TB cases that are tested for drug resistance and also have results recorded in the TB register (disaggregated by new and previously treated cases). Drug resistance testing includes phenotypic (culture DST) and genotypic (molecular DST by GeneXpert, LPA or other molecular technologies). Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of bacteriologically confirmed TB cases that are tested for drug resistance and have results recorded in the TB register. Denominator: Total number of bacteriologically confirmed TB cases notified during the reporting period	15% (2015)	20%	**NATIONAL DATA:** Not available Retreatment Not available **CTB REGIONS:** 35% (3,994/11,472) All cases (GeneXpert data could not be disaggregated by new and retreatment)

2.4.2	#/% of Xpert machines that are functional in country (stratified by Challenge TB, other).	Description: Proportion of Xpert machines that are functional in country Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of Xpert machines that are functional Denominator: Total number of Xpert machines.	83%: 55 GeneXpert (June 2015)	100% of availabe Gene Xpert machines are functional	National 68/70 (97%) CTB 16/17 (94%) 2 machines have all modules defected due to high temperature and dust
2.4.6	#/% of new TB cases diagnosed using GeneXpert	Description: Proportion of new TB cases diagnosed using GeneXpert Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of new TB cases diagnosed using GeneXpert Denominator: Total number of new TB cases	5% in June 2015	20% by end of Year 2 Target	CTB: 15.8% (3,882/24,515) This number includes retreatment. This is due to acute country wide shortage of Gene expert cartridges which impaired services
2.6.1	Average turnaround time from specimen collection/submission to delivery of result to the patient (stratified by microscopy, Xpert, culture, DST)	Description: This indicator measures average turnaround time from specimen collection/ submission to delivery of result to the patient (stratified by microscopy, Xpert, culture, DST). Note that this measurement requires operations research using a valid tool. Indicator Value: Number (of days) Level: National and Challenge TB geographic areas Numerator: Total number of specimen-days (lapsed from specimen collection/submission to delivery of result for each specimen) Denominator: Number of specimens	Microscopy: 48hrs GeneXpert 24hrs Solid Culture 10 weeks, DST 5 weeks (2014 CTRL Report)	Microscopy: 48hrs GeneXpert 24hrs Solid Culture 9 weeks, DST 4 weeks	Microscopy: 48hrs GeneXpert 24hrs Solid Culture 9 weeks, DST 4 weeks NB: Culture services has been decentralized to 5 zones in Tanzania which reduces TAT.

2.6.2	% of laboratory results disseminated via m-health or e-health systems to the provider	Description: Proportion of TB laboratory results disseminated via m-health or e-health systems to the provider Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of TB lab results disseminated via m-health or e-health systems to the provider Denominator: Total number of TB lab results	0% (2015)	30%	10,092 results disseminated by GX Alert. Denominator could not be obtained. Expect ERR and m health planned for APA 3 to make this data avalable
2.6.3	% of laboratory results disseminated via m-health or e-health systems to the patient/community health worker	Description: Proportion of TB laboratory results disseminated via m-health or e-health systems to the patient/ community health worker Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of TB lab results disseminated via m-health or e-health systems to the patient/ community health provider Denominator: Total number of TB lab results	0% (2015)	5% CTB	0% patients and CHWs cannot access Gx alert. Only RTLCs and NTLP central level can access GX Alert. We expect ERR and m health planned for APA 3 to make this data avalable
2.6.4	# of specimens transported for TB diagnostic services	Description: Number of specimens transported for TB diagnostic services via a specimen transport system Indicator Value: Number Level: National and Challenge TB geographic areas Numerator: Number of specimens transported for TB diagnostic services via a specimen transport system	New cases: 3874 Retreatment 849 (2014) CTB: New cases 2199 & Retreatment 491	20 % increment from the baseline	CTRL only data: New cases: 2959 Retreatment : 776 CTB: New cases 1959 & Retreatment 475 The decrease of samples is due to decentralization of TB culture services to Zonal TB Laboratories where the roll out and

					sensitization to clinicians was not well done
2.6.5	#/% of TB cases detected through a specimen transport system	Description: Proportion of TB cases detected through a specimen transport system Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of TB cases detected through a specimen transport system Denominator: Total number of lab confirmed TB cases	0 (0%) 2015	480	5 cases detected out of 4,617 samples transported in September 2016 using motorcycle introduced in the last 2 weeks of the 4th quarter in 2 CTB districts peripheral sites to nearby Genexpert centers.

Sub-objective 3. Patient-centered care and treatment

In line with the National strategic plan's priorities the project's focus in year two has continued to be on intensified case-finding among risk groups and provision of patient-centered care for patients with TB, MDR-TB and TB/HIV. Emphasis is on promoting provision of collaborative TB/HIV services and decentralizing PMDT services to lower level health facilities while maintaining the treatment success rate of MDR-TB at 75% or higher and increasing the number of the previously treated patients accessing a Drug Susceptibility Test from 10% to 20%.

Key Results

TB and TB/HIV

Collaborative TB/HIV services

CTB supported the NTLP in collaboration with other implementing partners to update various programmatic documents needed to facilitate implementation of TB and TB/HIV activities. These include the national TB/HIV policy, which will support HCW's implementation of new guidelines such as when to start ART in TB patients; the comprehensive supportive

supervision and mentorship package for HIV/TB; the TB – diabetes management guidelines; and the pediatric TB guidelines.

To improve access to patient-centered care and treatment, during this year CTB conducted health facility capacity assessments at 28 facilities in CTB regions for provision of integrated TB/HIV services. Assessment also involved infection prevention and control plans and practices. In CTB regions 301 (27%) out of 1098 DOT providing facilities have one stop shop model of care for TB/HIV compared to 9% in 2014. This has been possible due to efforts by the HIV program to expand HIV care and treatment services. Inadequate space was a major challenge in the majority of health facilities, which require various scales of renovation or even construction to improve the infrastructure. This is beyond the scope of CTB, but guidance was provided to the districts in order for them to improve the DOT clinics' infrastructure using their own funds.

During the year, CTB effectively worked to address low performance and suboptimal quality of services due to lack of essential knowledge and skills among health care workers and supervisors by training 30 TB coordinators on TB/HIV package and 115 coordinators on comprehensive supportive supervision and mentorship package. These trainings aimed at improving the capacity of health care workers to provide high quality integrated TB/HIV services and achieve better treatment outcomes with guidance from supervisory and mentorship teams from the district and regional levels.

CTB supported 42 districts to conduct TB/HIV coordination meetings during the first quarter, and similar meetings at regional level in all priority regions on quarterly basis. These meetings pulled together key stakeholders to discuss issues related to the implementation of TB, TB/HIV activities. It served both as platforms for advocacy, sensitization and decision-making on issues such as human and other resources allocation.

TB case notification showed an increasing trend in most CTB regions in the first 3 quarters, with only 2 regions of Arusha and Pwani maintaining the same performance throughout the year as illustrated below. Dar es Salaam region is responsible for this trend in notification with a drop of 300 TB cases in the last quarter that is attributed to documentation, this will be confirmed by a data quality assessment. 5,312(21.6%) of TB cases were notified through ICF among PLHIV attending HIV care and treatment clinics.

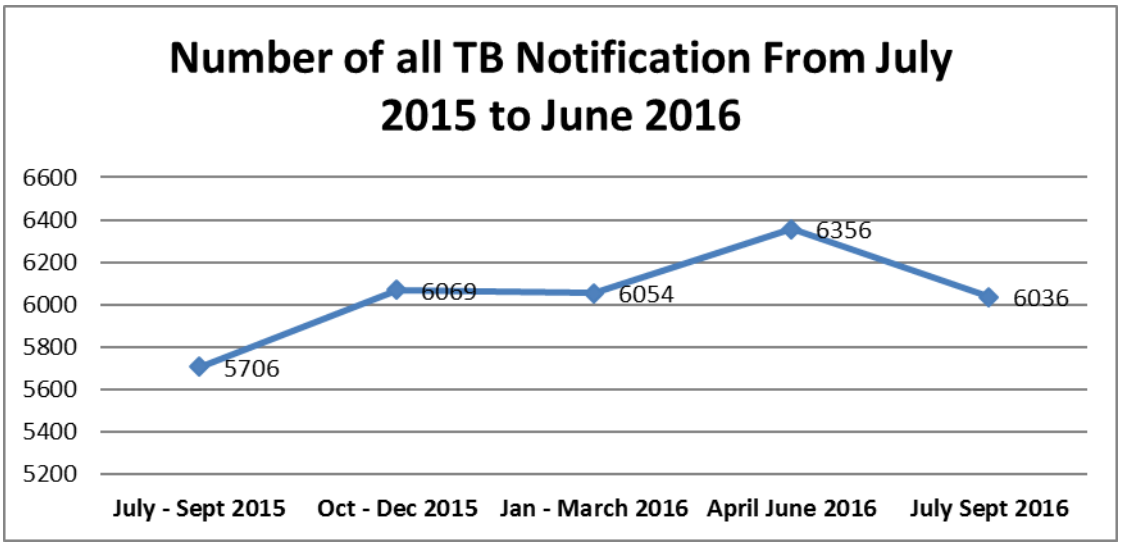

Figure 6: Trend of Tuberculosis notifications in CTB regions

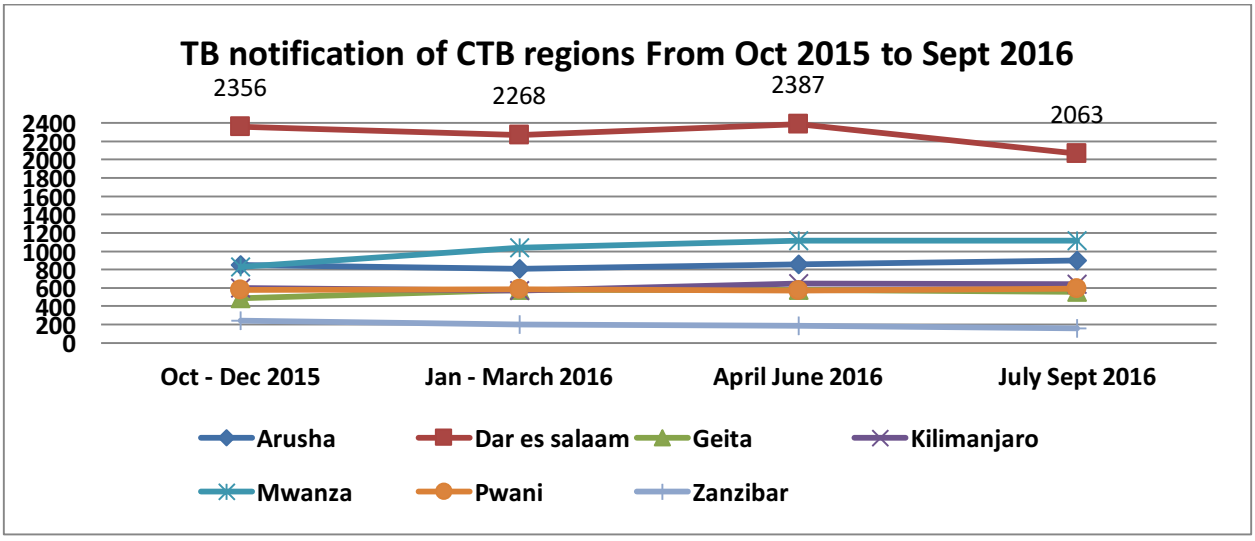

Figure 7: Trend of Tuberculosis notifications CTB regions

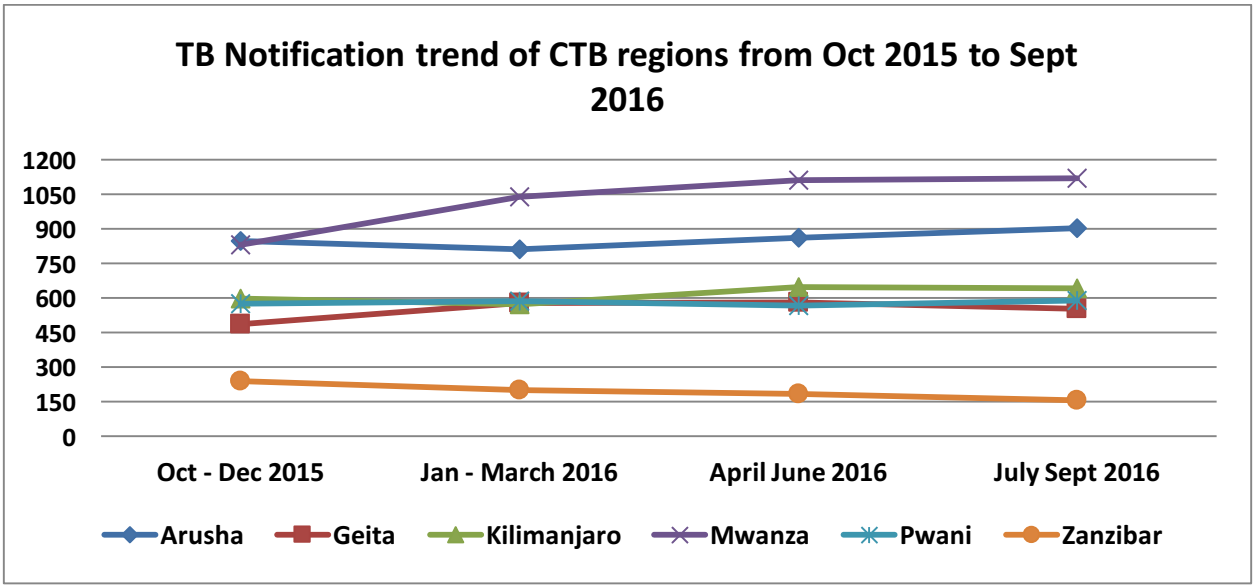

Figure 8: Trend of Tuberculosis notifications in Pwani region

Dar es Salaam region TB notification trend throughout the year has been as follows 2,356 (Oct -Dec 2015), 2,268 (Jan -Mar 2016), 2,387(Apr -June 2016) and 2,063 (July – Sep 2016). A decrease in overall notification in Q4 is noted Dar es Salaam region.

Performance of key TB/HIV indicators has maintained over the quarters in CTB priority regions; Out of 24,515 notified TB cases 24,173(99%) were tested for HIV compared to the national target of 100%, with a TB/HIV co-infection rate of 32.2%. About 98.5% (7825/7914) and 93.9% (7,433/7,914) of the co-infected patients were started on CPT and ART respectively.

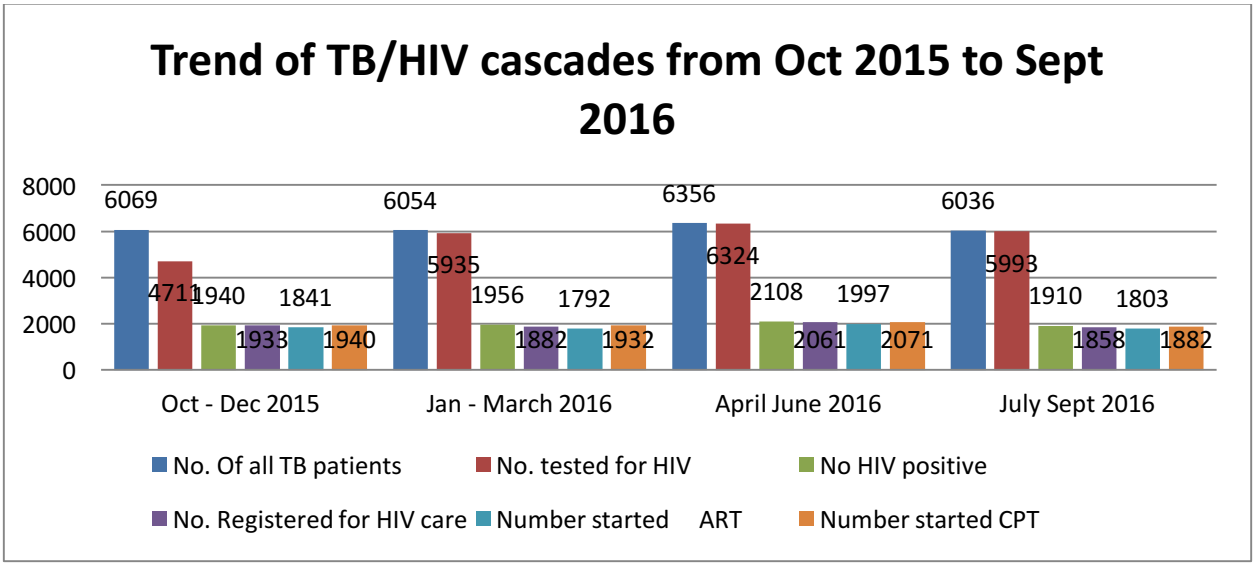

Figure 9: Trend of TB/HIV cascade in CTB regions

Improved knowledge and skills of district coordinators as a result of ongoing supportive supervision and mentoring has resulted in better performance as well as reinstitution of activities such as pediatric case finding and TB screening in Health Care Workers (HCW). The trend of Pediatric case notification increased from 9.3% of all notified cases in Q1 (Oct-Dec 2015) to 10% in the last quarter.

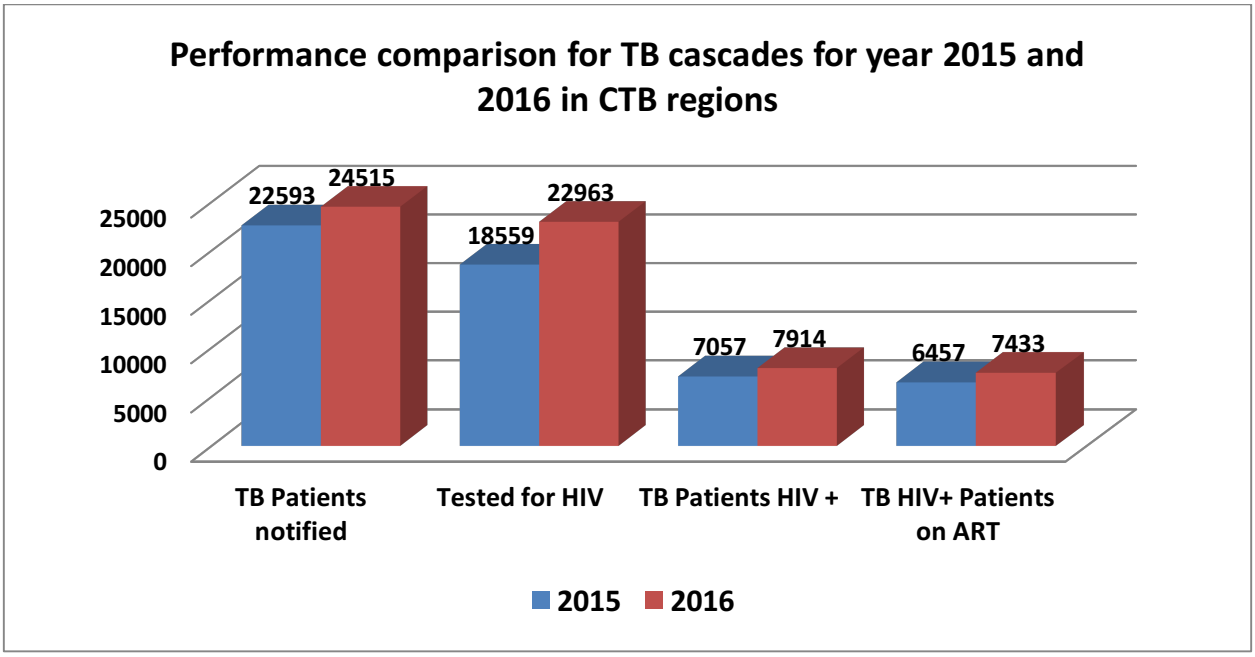

Figure 10. Comparison of TB cascades for Year 1 and Year 2

3. Decentralization of PMDT services

In preparation for the decentralization of PMDT services in the country, CTB together with NTLP and other stakeholders finalized the revision of a comprehensive PMDT training package for initiating sites. The package consists of a training curriculum, facilitators' guide, participants' manual and power-point presentations in line with the current WHO guidelines and the NTLP's decentralization framework. The curriculum covers DR-TB diagnosis, patient care, infection control, monitoring and evaluation. The package has already been used by the Ministry of Health, Community Development, Gender, Elderly and Children to train TB coordinators, clinicians, DOT nurses, laboratory staff, pharmacists and social welfare staff from initiating sites country-wide. 136 health care workers from 17 sites have been trained; 7 of the sites have started provision of PMDT services on an ambulatory basis. CTB also provided technical assistance in the revision of a PMDT training package for ambulatory sites that was done with GF support. The materials were already been used by the program however with decentralization, there was a need to make them suitable (with appropriate formatting) to ambulatory sites.

With CTB support, the program decentralized PMDT services from Kibong'oto Infectious Diseases Hospital (KIDH) to 7 PMDT initiation sites in the last quarter of APA 2: In quarter four, 24 (54.5%) patients out of total 44 were initiated treatment in decentralized sites. In APA2, a total of 217 cases were detected however 161 patients (74%) were initiated on treatment, which is 90% of the target of 179 for the year. The program in collaboration with CTB managed to reduce the discrepancy between those detected with MDR TB and those initiated on treatment by cleaning laboratory data and ensuring that there is no double counting starting from the second quarter. For the period of January to September 2016 124 (86%%) cases out of the 144 detected were put on treatment compared to 87/165 (52%) in the same period in APA1.

In order to enable patients on continuation phase of MDR TB treatment to visit ambulatory sites for care CTB, supported approximately 110 patients with an equivalent of USD 68 transport stipend on a quarterly basis.

Cohort reviews and expert panel reviews.

Cohort reviews for DR-TB patients from the annual 2013, 2014 and 2015 cohorts were conducted during the year with complicated cases discussed by a panel of experts. Treatment success rate for the 2013 cohort was 68%, down from 88.6% for the 2012 cohort. This drop in performance was contributed by deaths in the initial phase as a result of delay in initiation of treatment. It has been agreed in the last cohort review meeting to include mortality audits in the coming cohort meetings. The introduction of decentralization coupled with quality monitoring is expected to improve the challenge of access to quality health care challenge.

Cases discussed during expert review meetings range from management of psychiatric complications to management of collapsed lungs. The overall findings indicate that the culture conversion at 6 months is >85% suggesting effectiveness of the treatment during the initial phase. Contrary to this, there was high proportion of unknown culture results at 12 months with only 50% of the results available, this is expected to be resolved by the introduction of the electronic recording and reporting system with rigorous supportive supervision.

ATS developed a new tool for enhanced cohort reviews at facility level to enable DR-TB treatment initiation sites and sites handling patients on continuation phase to run "mini-cohorts reviews"

PMDT Technical Working Group

The PMDT TWG that was formed in year one continued to convene on a quarterly basis in APA2, providing a forum that acts as an advisory committee for the NTLP for discussing PMDT related issues in the country including plans for introduction of new and shorter regimens. A DR-TB counsilium was formed out of the TWG that provides technical support to clinicians, district and regional coordinators by discussing management of difficult cases with experts by phone and through a mobile phone application - Whatsapp. In APA3, teleconferencing using the project ECHO model will be introduced.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y2
3.1.1	Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	Description: The number of TB cases all forms (i.e. bacteriologically confirmed plus clinically diagnosed, new and relapse) reported by the NTP disaggregated by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e., gender, children, miners, urban slums, etc.) and/or case finding approach (ICF, ACF, CI). Private sector providers should be described according to context and case finding approach, for example, type of provider targeted (i.e. for profit medical clinics, pharmacists, informal providers, private hospitals, etc.) Indicator Value: Number and where available, percent Level: National and Challenge TB geographic areas Numerator: Number of TB cases all forms (bacteriologically confirmed + clinically diagnosed; includes new and relapse cases) reported (by setting/ population/ case finding approach) nationally and in Challenge TB geographic areas in the past year Denominator: Total number of TB cases (all forms) notified nationally and in Challenge TB geographic areas	National - 63,151 (all forms); CTB - 23,154 (all forms) (2014)	National: 71,866 CTB :27,309	Private 3,043/24,515 (12%), children 2,569/24,515 (10%), case finding 5,312/24,515 (22%)
3.1.4	Number of MDR-TB cases detected	Description: Total number of bacteriologically confirmed MDR-TB cases diagnosed. Project should follow the MDR-TB/Xpert algorithm in country regarding whether Rifampicin-resistant TB cases (RR-TB) should be counted as confirmed MDR-TB. If a country's algorithm states that a RR-TB cases is automatically assumed to be MDR-TB (i.e. no further DST required), then RR-TB should be included in the number of confirmed MDR-TB cases diagnosed. Otherwise, RR-TB should be excluded until proven via further DST that the case is a confirmed MDR-TB case. Indicator Value: Number Level: National and Challenge TB geographic areas Numerator: Number of bacteriologically confirmed MDR-TB cases diagnosed during the reporting period	144 (2014)	179	Total APA2: 217 (Q1-73, Q2 – 49, Q3 – 45, Q4 – 50) CTB: 109/217

3.2.1	Number and percent of TB cases successfully treated (all forms) by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (i.e. gender, children, miners, urban slums, etc.).	Description: The proportion of a cohort of TB cases (all forms, bacteriologically confirmed and clinically diagnosed, new and relapse) registered in a specified period that were successfully treated, whether with bacteriologic evidence of success ("cured") or without ("treatment completed") by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (gender, children, miners, urban slums, etc.) and/or risk population groups defined by national policy (IDUs, diabetics, prisoners, etc.). There may be overlap between settings and groups. Disaggregation by risk population is required in contexts where Challenge TB is providing treatment support for a specific group according to the annual work plan or in contexts where operations research allows for disaggregation and comparison across groups. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of new and relapse TB cases (all forms) registered in a specified period that were cured or completed treatment Denominator: Total number of new and relapse TB cases (all forms) registered in the same period	90% (2014)	90%	CTB: 89.4% (2015)
3.2.4	Number of MDR-TB cases initiating second-line treatment	Description: The number of bacteriologically confirmed, clinically diagnosed or unconfirmed MDR-TB cases started on second-line treatment during the reporting period. Unconfirmed MDR-TB cases are those awaiting C/DST results. RR-TB may fall under confirmed or unconfirmed depending on the country's MDR-TB diagnosis algorithm. Indicator Value: Number Level: National and Challenge TB geographic areas Numerator: The number of confirmed or unconfirmed MDR-TB patients started on second-line treatment in the reporting period	144 (2014)	179	161 (90% of target) (Q1 - 37, Q2 – 40, Q3 – 40, Q4 – 44) CTB 93/161

3.2.7	Number and percent of MDR-TB cases successfully treated	Description: The proportion of confirmed MDR-TB patients successfully treated (cured plus completed treatment) among those enrolled on second line TB treatment during the reporting period (where applicable disaggregation by HIV status, XDR status). RR-TB may fall under confirmed MDR-TB depending on the country's MDR-TB diagnosis algorithm. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of confirmed MDR-TB cases successfully treated (cured plus completed treatment) Denominator: Total number of confirmed MDR-TB patients enrolled on second line TB treatment during the reporting period.	75% (2011)	80%	68% (2013 Cohort) The number of deaths was very high 19/92 (21%) with 56% death in first 6 months, and 22% deaths on HIV co infection
3.2.10	#/% of planned cohort reviews conducted	Description: Proportion of planned cohort reviews conducted Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of planned cohort reviews conducted Denominator: Total number of planned cohort reviews	2 (2014)	4 (100%)	4 (100%)
3.2.11	% of HIV+ registered TB patients given or continued on CPT during TB treatment	Description: The purpose is to monitor commitment and capacity of programs to provide co-trimoxazole preventative therapy (CPT) to HIV-positive TB patients. It is important for programs to know the proportion of HIV-positive TB patients who receive this potentially life-saving therapy. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of HIV-positive TB patients, registered over a given time period, who receive (given at least one dose) CPT during their TB treatment Denominator: Total number of HIV-positive TB patients registered over the same time period.	>90% in 2012 according to NTLP annual report 2013	95%	CTB: 98.5%

3.2.12	% of HIV-positive registered TB patients given or continued on anti-retroviral therapy during TB treatment	Description: The purpose is to measure commitment and capacity of TB service to ensure that HIV-positive TB patients are able to access ART. This indicator measures people registered as HIV-positive who started TB treatment and who also started or continued on ART (i.e. recorded in ART register). Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: All HIV-positive TB patients, registered over a given time period, who receive ART (are started on ART) Denominator: All HIV-positive TB patients registered over the same given time period.	85%	85% maintain the same for CTB area	CTB: 93.9%
3.2.14	% of health facilities with integrated or collaborative TB and HIV services.	Description: The proportion of health facilities with integrated or collaborative TB and HIV services (includes 3Is, 5 NTP activities - HIV testing, HIV prevention methods, CPT, HIV/AIDS care and support, ART) Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of health facilities with integrated or collaborative TB and HIV services Denominator: Total number of health facilities with TB and/or HIV services	9% (2014)	30%	27%, insufficient funds to scale up trainings hence establishment of TB/HIV collaborative services
3.2.24	% MDR patients who receive social or economic benefits.	Description: Proportion of TB patients who receive any social or economic benefits (defined as tangible support through interventions delivering services, psycho-emotional support, material goods and/or financial assistances) during the first month of second-line drug (SLD) treatment. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of MDR-TB patients who receive any social or economic benefits during the first month of SLD treatment Denominator: Total number of MDR-TB patients initiating SLD treatment during the reporting period	0%(2014)	80%	100% (110/110) patients on continuation phase receive transport stipend quarterly.

3.2.25	% of MDR patients that are no longer infectious receiving outpatient care	Description: Proportion of MDR-TB patients that are no longer infectious receiving outpatient care Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of MDR-TB patients that are no longer infectious that are receiving outpatient care during the period of assessment Denominator: Total number of MDR-TB patients that are no longer infectious during the period of assessment	67% June 2015	80%	60.5% (109/180) With decentralization there are more infectious patients on outpatient care

Objective 2. Prevention

Sub-objective 4. Targeted screening for active TB

Key Results

Development of Community TB Care Guidelines and contact investigation activities

Challenge TB (CTB) supported the development of the "National Operational Guidelines for Community Based TB, TB/HIV and DR-TB interventions". The guidelines include guidelines for conducting and monitoring contact investigation activities in both English and Kiswahili languages. The guidelines will be used by Regional and Council Health Management teams and implementing partners country-wide. The use of these guidelines will enable community interventions to be done in a structured manner and the contribution of these interventions towards improving case detection to be monitored and measured. CTB supported the NTLP to print and distribute community monitoring and evaluation tools including a community register, screening form for TB, referral form and quarterly notification form in 7 supported CTB regions.

In the 4th quarter, CTB conducted contact investigation (CI) for 1621 bacteriologically confirmed (index) TB cases. 2597 household contacts were screened for TB symptoms; out of them 1035 person were identified as presumptive TB cases and were tested for TB using GeneXpert and LED microscopes. Out of these, 96 (9.3%) were diagnosed as TB cases and

initiated on anti-TB drugs: 26 by GeneXpert, 46 by sputum microscopy, 18 by CXR, 6 by pediatric score chart. This is an improvement from the previous quarter whereby was done for a total of 194 drug sensitive index cases, 444 of their contacts were screened and a total of 27 were confirmed to have drug sensitive TB out of the 215 that were presumptive. For 103 DR TB cases, we had a total of 291 contacts and all were screened, 30 were presumptive TB whereby 3 was confirmed RR and 1 was found with Mycobacteria other than Tuberculosis (MOTT). All were started on treatment, signifying the opportunity for detecting TB cases through systematic contact investigation.

Also in the 4th quarter, active case finding was conducted in Ilala, Kinondoni, Mwanza, Kilimanjaro and Geita regions targeting highly populated areas such as abattoirs, markets and mining areas. A total of 1338 were screened for TB, and 33 (2.4%) were diagnosed with TB: 7 by GeneXpert, 13 by smear microscopy, 12 by CXR and 1 by pediatric score chart. Among those screened, 251 were counselled for HIV and 10 were HIV positive and referred to HIV care for treatment.

Focused TB screening

In this reporting period, CTB took several actions to address low TB case detection in the priority regions. CTB supported the NTLP to develop key documents that will guide implementation of interventions to increase TB case detection. CTB also supported health care workers in 42 districts to conduct targeted TB screening among children and PLHIV

CTB also supported development of the national policy guideline document for collaborative TB/Diabetes services and updated the national pediatric TB guidelines and training package. These documents are expected to provide guidance to improve Pediatric TB diagnosis, care and treatment CTB in collaboration with NTLP and other implementing partners supported updating of the national Pediatric TB/HIV training package. CTB will use the package to train health care workers (HCW) in all priority regions in APA3 to impact on knowledge, skills and practices in Pediatric TB case finding.

Children below 15 years of age and PLHIV accounted for approximately 10% and 21% respectively of all notified TB cases over the four quarters.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target	Result
				Y2	Y2
4.1.1	#/% of eligible index cases of TB for which contact investigations were undertaken. Indicator Value: Percent	Description: The proportion of eligible index cases of TB for which contact investigations were undertaken Indicator Value: Percent Level: National and Challenge TB geographic areas	CI 62% (2013-CTB) DR TB 0% (June 2015)	80% for TB in CTB areas DR 20%	CTB : 1621/2133 (76%) DR 95/204(46 %)

		Numerator: Number of index cases of TB for which contact investigations were undertaken during the period of assessment Denominator: Total number of index cases registered during the period of assessment			
4.1.3	% of confirmed TB patients by case finding approach (CI, ACF, ICF), by key population and location (ex, slum dwellers, prisoners) (Service cascade)	Please refer to indicator 3.1.1 above	CI: 3%(2014)	CTB 3%	CTB: 22% (5,312/24, 542)
4.2.4	#/% of TB patients linked with support for comorbidities (stratified by malnutrition, diabetes, drug use, etc.)	Description: Proportion of TB patients who receive medical support from other programs for comorbidities (malnutrition, diabetes, drug use, etc.) Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of TB patients who receive medical support from other programs for comorbidities Denominator: Total number of TB patients with comorbidities	Not available	Not available	The current recording and reporting system does not capture this information Plan to start in APA 3 after the guidelines become available for diabetes.

Sub-objective 5. Infection control

PMDT and TB/HIV care settings were assessed for TB infection prevention and control as well as screening for TB among health care workers.

Key Results

In line with improving access to quality integrated TB/HIV services, CTB conducted TB IPC assessment in 4 health facilities from each priority region, for a total of 28 facilities. All the

facilities were supported to develop, implement and monitor TB IPC plans to ensure prevention of TB transmission.

Health care workers' screening

CTB has continued to strengthen TB surveillance among HCWs in all priority regions, whereby out of 35,036 HCWs in CTB supported regions 7,546 were screened for TB and 33 (0.43%) were confirmed to have TB and started on treatment in three quarters. Showing a better response from the health care workers through the quarters. There is a need to review the existing TB in the workplace policy that currently does not address health care workers; this has been a challenge when sensitizing health care workers as there is no policy guidance.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result
5.1.5	#/% of high-risk sites in which TB IC is implemented with Challenge TB support (stratified by applicable sites: PMDT, HIV, mines, prisons, etc.)	Description: This indicator measures the number and percent of high-risk sites in which TB IC is implemented with Challenge TB support (stratified by applicable sites: PMDT, HIV, mines, prisons, etc.) Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of high-risk sites in which TB IC is implemented with CTB support in the area Denominator: Total number of high-risk sites in the area	0	25%	738/1,098 (67%) Dissaggregation will be available by HIV, PMDT in APA 3
5.2.1	Status of TB disease monitoring among HCWs	Description: This indicator measures the status of TB disease monitoring among HCWs in the country. Indicator value: Score based on below: 0=no policy/plan/ monitoring in place; 1=policy and scale-up plan for addressing TB among healthcare workers are enacted by the MoH; 2= monitoring program piloted or limited to certain areas; 3=annual reporting on TB among HCWs is available as part of the national R&R system	TBD (Q2 in APA2)	TBD after the baseline	0 The policy is not yet finalized though CTB was allowed to sensitize and screen HCWs so as to inform the ministry

		Level: National			for policy development
5.2.2	#/% of HCWs screened (frequency of measurement based on policy)	Description: This indicator measures the number and percent of HCWs screened for active TB disease in line with national policy during the reporting period. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of HCWs screened for active TB disease in line with national policy during the reporting period Denominator: Total number of HCWs	760/21,078 (3%) CTB	CTB: 4,215/ 21,078 (20%)	CTB: 4,039/ 2,1078 (19%)
5.2.3	Number and % of health care workers diagnosed with TB during reporting period	Description: This indicator measures the percent of healthcare workers (HCWs) diagnosed with TB (all forms) annually (disaggregated by gender and age). This measurement may require a special study using a validated tool and/or methodology. Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of HCWs diagnosed with TB (all forms) during past year Denominator: Total number of HCWs in the same year In countries where the NTP does not collect this indicator or is not willing to share the data, Challenge TB should document this challenge.	17 -0.09% (Q3 APA 2) CTB	0(0%)	33/21078 (0.15%) CTB (APA2)

Sub-objective 6. Management of latent TB infection

CTB collaborated with regional and district TB, TB/HIV coordinators to adopt an Isoniazid Preventive Therapy (IPT) register to facilitate documentation of treatment for LTBI in children aged under 5 years of age to ensure prevention of disease progression. HCWs and district coordinators are being continuously sensitized to actively engage in contact tracing of bacteriologically confirmed TB cases, initiating eligible children on IPT and documenting for the purpose of follow up and reporting. Currently there is no national tool for collection of IPT data at TB clinics. The NTLP is expected to adopt this recording and reporting tool countrywide following evidence of its usefulness in CTB regions.

Key results

- A total of 594 children aged under 5 years of age were initiated on IPT from quarter 2 to quarter 4. This reporting has been possible for the first time this year. All 127 children initiated on IPT in the second quarter completed treatment by the end of the 4th quarter. Due to absence of recording and reporting tools, those initiated on IPT in Q1 were not reported.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result
6.1.11	Number of children under the age of 5 years who initiate IPT	Description: The number of children under the age of 5 years who initiate isoniazid preventive therapy (IPT) during the reporting period. Indicator Value: Number Level: National and Challenge TB geographic areas Numerator: The number of children under the age of 5 years who initiate IPT during the reporting period.	N/A	600CTB	CTB: 594
6.1.2	% of eligible persons completing LTBI treatment, by key population and adherence strategy	Description: This indicator measures the percent of eligible persons completing LTBI treatment, by key population and adherence strategy according to national policy Indicator Value: Percent Level: National and Challenge TB geographic areas Numerator: Number of eligible persons completing LTBI treatment	NA	100% of those initiated IPT	127 (100%) started IPT in Jan - March 2016 (FYI: These who started treatment in Jan – March are the ones completing IPT by end of Q4)

		Denominator: Total number of eligible persons			
6.1.5	A national quarterly monitoring system for LTBI initiation and completion is functional	Description: The country has a functional quarterly monitoring system for LTBI initiation and completion Indicator Value: Yes/No Level: National	No (June 2015)	Yes	No The country system for quarterly monitoring is not in place, however CTB does during supervisions and quarterly performance review meetings

Objective 3. Strengthened TB Platforms

Sub-objective 7. Political commitment and leadership

The country team together with the NTLP aims at advocating for commitment from the government and developing a sustainable financing strategy (e.g., exploring resource mobilization from different levels of government and involvement of various private sector entities). This will promote local ownership and sustainability of TB control efforts by the government and private sector increasing financing in the health sector exponentially over time.

Key results

A sensitization session for parliamentarians was planned together with the NTLP and the minister of health. The session aimed at engaging these key policy and political leaders in order to advocate for resource mobilization in the local government authorities in their constituents as well as in the national budget. Due to unavoidable circumstances this activity was postponed to November 2016.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y
7.2.1	% of NTP budget financed by domestic resources	Description: This indicator measures the percent of the NTP budget financed by domestic sources Indicator Value: Percent Level: National Numerator: The amount of NTP expenditures from domestic sources during reporting period Denominator: Total NTP expenditures in the period	15% by 2013 NTLP Annual report	TBD after stakeholders meeting in Year 2)	0%
7.2.3	% of activity budget covered by private sector cost share, by specific activity	Description: This indicator measures the proportion of CTB project activity budget covered by private sector cost share (if not monetary, will require estimation of costs) by specific activity. Indicator Value: Percent Level: Nationally for activities at national scale and in Challenge TB geographic areas for activities focused in specific geographic areas where Challenge TB is working. Numerator: Amount of private sector cost share covering CTB project activity during most recent fiscal year Denominator: Total CTB project activity budget plus private sector cost share amount during the year of assessment.	N/A	N/A	N/A

Sub-objective 8. Comprehensive partnerships and informed community involvement

To maximize synergy of operations of the large network of partners supporting TB prevention and care activities in the country there is a need for establishment of a national coordinating body.

Key results

CTB together with the NTLP and a core group of stakeholders from government agencies, non-governmental organizations and the private sector are in the initial stages of establishing a national Stop TB partnership. A terms of reference for the partnership as well as criteria for membership have been agreed upon. The partnership is expected to focus on advocacy of TB issues and resource mobilization.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y
8.1.1	#/% of national partnership members that are from the private sector, civil society, or current/previous TB patients (stratified by each key group)	Description: The number and percent of national Stop TB partnership members that are from the private sector, civil society, or current/previous TB patients (stratified by each key group) Indicator Value: Percent Level: National Numerator: The number of national Stop TB partnership members that are from the private sector, civil society, or current/previous TB patients Denominator: Total number of national partnership members	to be collected after the first meeting (Q1 of APA2)	After baseline	0 Initial preparations for establishment of the partnership have started i.e ToR, checklist for potential members developed
8.1.3	Status of National Stop TB Partnership	Description: This indicator measures the status of National Stop TB Partnership by using special questionnaire for collecting relevant country level data Indicator Value: The score based on below: 0= no National Stop TB Partnership exists 1= National Stop TB Partnership established, and has adequate organizational structure; and a secretariat is in place that plays a facilitating role, and signed a common partnering	0	1	0 Initial preparations for establishment of the partnership have started i.e ToR, checklist for potential members developed

		agreement with all partners; but does not have detailed charter/plan, and does not meet regularly/ produce deliverables; 2= National Stop TB Partnership established, has adequate organizational structure and in a participatory way has developed detailed charter/plan, but does not meet regularly and does not produce deliverables; 3= National Stop TB Partnership established, has adequate organizational structure, has developed detailed charter/plan, meets regularly and critical deliverables are produced Level: National			
8.1.4	% of local partners' operating budget covered by diverse non-USG funding sources	Description: This indicator measures the proportion of CTB project local partners' operating budgets covered by non-USG funding sources. A special questionnaire for collecting relevant country level data among CTB local partners is available. Indicator Value: Percent Level: Challenge TB geographic areas Numerator: Amount of CTB local partners' operating budgets covered by non-USG funding sources (TGF, WB, EU, ADB, DFID, private donations, investment income, other revenue, etc.) Denominator: Total operating budget of CTB local partners' operating budget (USG + non-USG sources) during the year of assessment.	N/A	N/A	CBO 1 (NELICO): 653,500/774,000 US$ (84%) CBO 2 TOKKIUKI: 0/14,646$ (0%) CBO3 SANAA WALIPO $681/681 (100%)

8.2.1	Global Fund grant rating	Description: This indicator presents Global Fund TB grant performance rating results Indicator value: Score is based on the following: A1 Exceeds expectations A Good performance A2 Meets expectations B1 Adequate B2 Inadequate but potential demonstrated C Unacceptable Level: National	A1 (2014)	A1	A1

Sub-objective 9. Drug and commodity management systems

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y
9.1.1	9.1.1. Number of stock outs of anti-TB drugs, by type (first and second line) and level (ex, national, provincial, district)	Description: This indicator should be used to report the number of stock outs of any type of TB drug at any level of the health system that results in interruption of treatment. Indicator Value: Number Level: This indicator should be reported at whatever level a stock out that results in interruption of treatment occurs.	0	0	0

Sub-objective 10. Quality data, surveillance and M&E

TB surveillance electronic recording and reporting system.

CTB continued providing technical support for development of the TB surveillance electronic recording and reporting system. Needs and requirements for the roadmap, set by stakeholders in APA1, were discussed and re-evaluated. The contents of the system are set to be in line with the standards of data quality, government regulations, WHO and national guidelines also guaranteeing patient confidentiality and data security. This activity is expected to continue to be implemented in a step-wise fashion according to the developed roadmap i.e development of the data dictionary, revision of the costing plan, review of the prototype, support testing and piloting expected to be in May 2017 before roll out of training of the system in July 2017. The system is expected to start operating in phases in January 2018. This system is expected to solve a lot of data collection and reporting challenges experienced in the country.

Data quality

In our efforts to ensure accuracy of data recording and reporting CTB engaged an external consultant to support the National TB and Leprosy Program (NTLP) to review and develop a new Routine Data Quality Assessments (RDQA) tool. The tool has components for system assessment, data verification, and completeness checking and improvement plan. Indicators with variance of +/- 2% are listed and improvement plans are made. This tool has been oriented to regional and district coordinators in CTB regions and has been utilized in 5 CTB regions of Kilimanjaro, Arusha, Dar es Salaam, Pwani and Mwanza as it continues being used in other non-CTB supported regions in the country to improve data quality. Issues found were inconsistency of reported data with source documents which occur during transcription of data from patients' files to unit registers and from unit registers to district registers and due to irregular update of the registers. It was agreed on improvement plans that: 1. data at facility level will be updated at end of every day by DOT nurses and 2. district registers will be updated every month using the unit registers by DTLCs. The project also supported a training of district coordinators on recording and reporting tools in order to improve documentation, timely reporting, quality of data reported and understanding of USAID/PEPFAR indicators and reporting requirements.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target	Result
				Y2	Y
	10.1.4. Status of electronic recording and reporting system	Description: This indicator measures the status of electronic recording and reporting (ERR) Indicator value: Score based on below:	1 (2015)	2	1

		0=R&R system is entirely paper-based; 1=electronic reporting to national level, but not patient/case-based or real time; 2= patient/case-based ERR system implemented in pilot or select sites (TB or MDR-TB); 3=a patient/case-based, real-time ERR system functions at national and subnational levels for both TB and MDR-TB; 4= a patient/case-based, real-time ERR system is functional at national and subnational levels for both TB and MDR-TB completely and meets WHO standard for TB surveillance data quality - i.e., data in the national database are accurate, complete, internally consistent, within timelines set, validated and free of duplicates and a data quality audit system is put in place (source: Standards and Benchmarks for Tuberculosis Surveillance and Vital Registration Systems – Checklist and User Guide, WHO, 2014). Level: National			
	10.2.1. Standards and benchmarks to certify surveillance systems and vital registration for direct measurement of TB burden have been implemented	Description: National TB surveillance system is certified based on WHO standards and benchmarks for TB surveillance and vital registration systems (for paper-based or electronic systems). For a country's TB surveillance systems to be certified as providing a direct measurement of TB cases and TB deaths, all 10 standards and their associated benchmarks (Part B, Section 1) should be met (source: Standards and	Yes (2013)	Yes	no This was done in 2014

		Benchmarks for Tuberculosis Surveillance and Vital Registration Systems – Checklist and User Guide, WHO, 2014). The country standards and benchmarks score will be monitored as a sub-indicator to track progress. Indicator Value: Yes/No Level: National			
	10.2.6. % of operations research project funding provided to local partner (provide % for each OR project)	Description: This indicator measures the proportion of Challenge TB-supported operations research project funding provided to local partner(s), by each OR project. Indicator Value: Percent Level: Challenge TB geographic areas Numerator: Amount of operations research project funding provided to local partner by Challenge TB during a year Denominator: Total Challenge TB operations research budget during the year of assessment.	0% (2015)	1%	0% OR not yet funded, proposals have been submitted by university students, implementation will commence in October 2016. Activity was planned in APA 2 but implementation has been delayed
	10.2.7. Operational research findings are used to change policy or practices (ex, change guidelines or implementation approach)	Description: For all Challenge TB-supported operation research projects implemented in a country, results of these projects are used to change policy or practices (ex. change guidelines or implementation approach). Relevant data are collected/ presented for each individual project by special report with qualitative details. Indicator Value: Yes/No Level: National	N/A	Yes	No

Sub-objective 11. Human resource development

In ensuring that there are competent regional, district and facility teams with appropriate knowledge, skills and competencies that are in line with the WHO and national guidelines as stipulated by the NTLP, supportive supervision and mentorship was done in all CTB supported regions.

Key results

Supportive supervision and mentorship

CTB supported 42 council and regional health management teams to conduct monthly and quarterly TB, TB/HIV supportive supervision visits respectively at selected facilities. A total of 169 DTLCs, DLTs, TB/HIV officers participated in these visits where service providers were mentored on various aspects of TB and TB/HIV patient centered care as well as monitoring and evaluation. CTB also participated in updating the national comprehensive supportive supervision and mentorship training package which was used to train coordinators in two CTB regions to strengthen their supervisory, coaching and mentoring skills. In this training a total of 20 coordinators were trained i.e. 6 females and 14 males.

#	Outcome Indicators	Indicator Definition	Baseline (Year/ timeframe)	Target Y2	Result Y
11.1.1	Status of system for supportive supervision and evaluation of supervision plan conducted	Level: National Means of Verification: TB NSP, SS guidelines, SS implementation plan and budget, SS reports Indicator value: Score based on below: 0=no supportive supervision guidelines developed and no consistent supportive supervision taking place; 1=supportive supervision plan developed, but not implemented systematically; 2=supportive supervision plan implemented consistently, including provision of written feedback to lower levels; 3=supportive supervision plan implemented consistently, feedback provided	0	2	2
11.1.2	% of planned supervisory visits conducted (stratified by NTP and Challenge TB funded).	Description: The proportion of planned supervisory visits conducted (stratified by NTP and Challenge TB funded) Indicator Value: Percent Level: National and Challenge	2: June 2015	100% 12 District supervisions, 4 Regional and Central Supervisio	100% 532/532 (12 District supervisions, 4 Regional and Central Supervisio

		TB geographic areas Numerator: Number of planned supervisory visits conducted during reporting period Denominator: Total number of supervisory visits planned for the same period		ns in 42 districts	ns in 42 districts)
11.1.3	# of healthcare workers trained, by gender and technical area	Description: This indicator measures the number of healthcare workers (which includes health facility staff, community health volunteers, laboratory staff, sputum transport technicians, community-based DOTS workers) trained, by gender and sub-objective. Training includes any in-person, virtual, or on-the-job training that is longer than half a day and for which curriculum is available. This indicator is interchangeable with 'Number of individuals trained in any component of the WHO Stop/End TB Strategy with USG funding' which USAID missions may have as a requirement for internal agency reporting. Indicator Value: Number Level: National and Challenge TB geographic areas Numerator: Number of HCWs trained during the reporting period	N/A	1,272	Total: 609 Enabling environment 227 (M 114, F 113) Comprehensive high quality diagnostics 50 (M 40, F 10) Patient centered care and treatment 276 (M 190, F 86) Data quality, surveillance and M&E 56 (M 46, F 10) Budget did not allow for all trainings to take place
11.1.5	% of USAID TB funding directed to local partners	Description: This indicator measures the proportion of CTB annual funding directed to local partners Indicator Value: Percent Level: National. Although CTB may be working with local partners in specific geographic areas, the overall total going to local partners at any level should be included in the numerator	N/A	1%	0.8%

		and compared to the overall country budget. Numerator: Amount of CTB country project funding directed to local partners during the most recent fiscal year Denominator: Total CTB country project budget during the most recent fiscal year.			

6. Challenge TB Support to Global Fund Implementation

Current Global Fund TB Grants

Name of grant & principal recipient *(i.e., Tuberculosis NFM - MoH)*	**Average Rating***	**Current Rating**	**Total Approved/Signed Amount****	**Total Committed Amount**	**Total Disbursed to Date**
TZA–T-MoF	Not available	Not available	$ 21,377,285	$ 12,562,248	$5,660,590
TZA-C-STC	Not available	Not available	$13,059,126	$7,798,266	$1,246,624

** Since January 2011*
*** Current NFM grant not cumulative amount; this information can be found on GF website or ask in country if possible.*

In-country Global Fund status - key updates, current conditions, challenges and bottlenecks

The current Global Fund grant was awarded in July 2015 and will end in December 2017. The grant titled 'Sustaining the momentum and improving the Gains for HIV/TB' under the grant name; TZA-T-MOF was based on a joint TB/HIV concept note submitted by the Tanzanian National Coordinating Mechanism (TNCM) in 2014. The program is implemented by two PRs: A public PR – Ministry of Finance and a private PR – Save the Children (TZA-C-STC). Ministry of Finance is focusing on procurement of health commodities and medicines, strengthening Health Management Information Systems (HMIS) and service delivery to the health facility level while Save the Children on its part is focusing on interventions at community level. In

general, the grant focuses on the following TB specific priority interventions: improving case detection for TB, improving TB diagnostic capacity, scaling up Programmatic Management of Drug Resistant TB, community systems strengthening, reduction of stigma and discrimination as well as promotion of TB/HIV collaborative services.

Key challenges in grant implementation include; (1) slow cash transfers within the Government of Tanzania system (Ministries – MoF, MoHCGED, PMORALG, Regional Authorities and Local Government Authorities), prolonged procurement processes in line with government procurement procedures and inadequate human resource capacity at all levels of the health system.

These challenges were discussed during the Joint TB situation room partners' mission in context of implementation through partnership visit in the second quarter. The mission consisted of representatives from WHO, GF, Stop TB partnership and USAID. Areas of focus identified during the mission included PMDT scale up, laboratory services support, TB case finding, NGO engagement, community-based activities, procurement and supply management as well as program and grant management.

Since the situation room visit, there have been updates and good improvement on implementation of activities. In general all delated activities, fast track measures were put to make sure that activities are implemented on time. With collaboration with partners such as KNCV- Challenge TB project, the status improved from 48% performance since Feb to 84% at the end of June 2016.

Drug resistant Survey implementation has been fast tracked by involving WHO who were able to provide the NTP with the Consultant and the fund gap has been submitted in the GF Reprogramming request.

The fund gap for the case based ERR system was immediately submitted to GF who by June were able to grant the approval and provide the NTP with the fund. With technical support through CTB, the Developing Process is ongoing as re planned.

Emergent critical shortage of Gen Xpert Cartridges in the country: An urgent request of 87,000 cartridges was given to USAID. In the period of March and April NTLP received 41,200 cartridges from USAID Mission, 5500 from FIND, 2,500 from CTB, 15,000 from WHO. During June through July the NTP collaboratively with KNCV-Challenge TB fast tracked the distribution in the country. The gap of around 26,000 cartridges has been requested from GF through reprogramming submitted on September 2016. This batch is expected to cover up to July 17. Beyond July 17 will be covered by stock which is in process to be procured through yearr 2 of GF grant of which quantification has been done in August 2016.

The suggestion to develop the Intensive case finding tool kit as a means to improve quality has been adopted with the NTP and since then, the GF has been providing Technical assistant and for the startup of the process.(Assessment, Tool kit-draft, Orientation to pilot in the regions). In year 3, CTB plan to utilize the same tool to improve the quality of services hence increase in TB case detection.

Challenge TB involvement in GF support/implementation and any actions taken during Year 2

With support from the Global Fund, CTB and NTLP collaboratively conducted cohort and expert panel review of 18 complicated patients and a cohort review of 139 DR-TB patients. This collaboration enabled representatives from all regions with DR-TB patients in the specified cohorts to attend a week-long workshop where TB coordinators from different regions of the country got a chance to learn from a panel of experts.
Global Fund through the NTLP also supported transportation of 37 patients from different regions in the country to Kibong'oto Infectious Disease Hospital (KIDH) for DR-TB treatment initiation. Likewise, GF support covered costs for conducting DR-TB supportive supervision in some of the regions with CTB supporting patients' stipends in those regions.

CTB collaborated with NTLP/Global Fund in conducting assessment of regional facilities' capacity to manage PMDT patients. Out of 20 initiation sites, 9 and 11 were supported through KNCV/CTB and NTLP/Global fund respectively.
CTB provided short-term technical support to develop the ambulatory sites training package. NTLP/Global Fund used the finalized training package to train 90 healthcare workers. During the year, the NTLP developed a facility-based active case-finding tool with support from the GF; CTB will adopt this tool in supported regions in APA3 to enhance facility-based TB case finding.

7. Challenge TB Success Story

Saving the lives of health care workers through systematic TB screening.

Globally, health care workers are at high-risk group of TB infection due to their occupational exposure. Around 33% of the world's population is estimated to have latent TB infection (LTBI), this means they do not have active TB disease but may develop it in the future, and it is estimated that the prevalence of LTBI among health care workers is even higher at 54%.

Tanzania is a high burden country for both TB and HIV, which puts health care workers at significant risk of acquiring TB while at work. TB/HIV co-infection is when someone has both TB and HIV, and each disease can affect the progression of the other. In addition to HIV infection speeding up the progression from latent to active TB, TB bacteria can also accelerate the progress of HIV infection.

Pooe TB infection prevention and control practices are one of key factors in health care workers becoming infected. Until recently, there has been no program for the systematic TB screening among heath care workers, nor has there been a guiding policy. Given the relationship between TB and HIV, stigma and self-stigmatization are among key unresolved challenges among health care workers as well as in the general population. This has resulted in late diagnosis and treatment initiation, and ultimately the loss of many lives.

In January 2016, the USAID funded Challenge TB project introduced TB screening among health care workers in the seven regions it supports. In its first six-month of operation it had already proved to be a lifesaving intervention. Of the 17,008 health care workers in CTB regions, 3,507 were screened and 24 (0.6%) were diagnosed with TB, one of them with multi-drug resistant TB. All those found to be infected were immediately started on anti-TB treatment.

*One health care worker currently receiving MDR-TB treatment said: "*I *have been working for more than 30 years, serving others, in all this time I never thought I could get TB. Using GeneXpert technology I received my results quickly and here I am, alive and receiving treatment at Kibong'oto. Thanks to this quick test, I was quickly referred to hospital and promptly initiated on treatment, without early treatment I would have died of drug-resistant TB".*

Another said, *"It was difficult for me to believe that I am suffering from TB after serving TB patients for more than ten years at a DOT center, but I thanks to the screening initiative, my life has been saved".*

The lives of health care workers will continue to be saved with as the Challenge TB team continues to support regional and district teams to screen all its frontline staff.

KNCV Field Coordinator leading a discussion between the regional TB coordinator part of the management team at a facility where a health care worker was diagnosed to have TB on how to implement infection prevention and control measures at the facility.

A health care worker diagnosed with TB sharing her experience during a regional quarterly performance review meeting in Dar es Salaam (Photo credit: John Minde, KNCV Field Coordinator)

8. Operations Research

Title of OR study	Local partners involved in study	Implementation Status	Key findings	Dissemination
1. Which is the best model of accessing MDR-TB treatment, what is feasibility and what are challenges for each model according to patients and health care workers?	Muhimbili University of Health and Allied Sciences (MUHAS) student	Finalization of the protocol and budgets	N/A	N/A
2. What are the barriers to timely definitive diagnosis and treatment after DR-TB suspicion?	Muhimbili University of Health and Allied Sciences (MUHAS) student	Finalization of the protocol and budgets	N/A	N/A

9. Key Challenges during Implementation and Actions to Overcome Them

Challenge	Actions to overcome challenges
Technical	
Due to competing priorities with the NTLP / CTRL some activities have had to be postponed causing various inconveniences and disruptions.	To complement and foster close collaboration, CTB and the NTP have resolved to share monthly plans among the technical officers to avoid unexpected changes.
Inadequate funds to train CTB regions' HCWs on TB, TB/HIV, MDR TB, ACSM & new recording and reporting tools	Provide mentoring and on job training during supervisions
Availability of laboratory data has been very challenging since there is no electronic system. Getting national data has also been challenging as they have different reporting timelines.	Incorporation of the laboratory component into the ERR system currently being developed. Agreed with NTLP that all lab data to be reported on monthly basis
ACSM training package and community TB, TB/HIV and DR-TB guidelines were developed in the English language. Difficulty in use of the materials during piloting showed the need for translation to Kiswahili language.	The ACSM training package and community guidelines have been translated into Kiswahili language in collaboration with NTLP and other implementing partners.
Achieving TB case detection targets has been a challenge. This has been attributed to inadequate community involvement in active case finding, low suspicion index by HCWs, interrupted laboratory supplies and inadequate TB Lab infrastructure	Joint efforts to address these challenges are underway, including implementation of the ACSM and FAST strategies and community TB care guidelines, continuous mentorship for health care workers, assisting in forecasting of laboratory supplies and promote renovations of TB laboratories
Limited space for provision of integrated TB/HIV services in majority of health service delivery sites and lack of financial resource for renovation.	Embark on differentiated (several different types) service delivery models, building capacity of community health care workers to provide service at community level.
There was a delay in the PMDT decentralization process due to renovation requirements of the sites earmarked earlier which could not be supported by CTB as per USAID rules and regulations as the BOQs included excavations and constructions	The NTLP has resolved to start the decentralization process by initiating treatment at sites that provide drug sensitive TB care as they are. IPC issues will be addressed accordingly as the process is ongoing. Sensitization of healthcare workers

which would increase the footprints of the buildings. This also affected renovation of TB/HIV sites	and decision makers (RHMTS & CHMTs) is being done to address stigmatization
Critical shortage of GeneXpert cartridges in some sites during first and second Quarter of APA 2 in the country following inadequate national quantification procedures.	CTB procured and distributed in CTB sites, also assisted the NTLP with redistribution and has continued to actively monitor stock status through the GXalert system together with calling sites not yet linked to GXalert to enquire about stock status every fortnight. CTB's EQA focal person stationed at the CTRL is also assisting the national GeneXpert focal person and the logistics officer with forecasting and quantification of GeneXpert cartridges in line with the GeneXpert roll out plan.
Administrative	
Obtaining VAT exemptions has been very challenging as the Tanzania Revenue Authority (TRA) requires submission of Electronic Fiscal Device (EFD) receipts that many vendors especially in the field are not yet registered for and do not issue	Ensure that procurement processes are initiated well in advance to avoid delays. In order to ensure that, we do not incur storage fees for items sourced out of Tanzania, while waiting for the VAT exemptions, we have been ensuring that we initiate the process early and request the supplier to ship items when all exemptions documents are ready.
There is security threat to staff when they carry large amounts of cash for payment of participants during trainings or meetings.	CTB engaged mobile banking, whereby payments are made direct to participants' cell phone numbers. The banking mobile wallet system is not without glitches which cause some transactions to delay and/or fail completely, efforts are ongoing to improve functionality of the system.

10.Lessons Learnt/ Next Steps

- Due to the sensitivity and specificity of smear microscopy being low compared to GeneXpert, GeneXpert should be used for active case finding instead of smear microscopy but Xray can be used as a sensitive screening tool followed by Xpert as a confirmation after a positive x-ray or TB symptoms with CTB active screening approaches.
- Quote TB results can be used to improve quality of TB services in health facilities with similar settings implementing TB services in CTB supported regions.
- Engaging the CBOs in community TB activities will increase TB notification because of increase in knowledge and awareness of TB in the community.

- Systematic TB disease surveillance among HCWs is implementable and needs to be formalized by policy formulation to address prevention of occupational TB disease transmission among HCWs. CTB plans to work with NTLP and other stakeholders in APA 3 to revise the national TB at work place policy to include systematic HCW TB screening.

- For decentralization of PMDT services it was difficult to start with referral hospitals as previously thought as the sites required construction that was not in line with USAID rules and regulations. Experience has shown that it is possible to start with lower level health facilities that have good infection prevention and control practices. The NTLP's decentralization roadmap needs to be revised to accommodate this change.

Annex I: Year 2 Results on Mandatory Indicators as well as National Data on the Number of pre-/XDR-TB Cases Started on Bedaquiline or Delamanid

MANDATORY Indicators				
Please provide data for the following mandatory indicators:				
2.1.2 A current national TB laboratory operational plan exists and is used to prioritize, plan and implement interventions.	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	0	N/A	**Substantial**	Lab strategic plan developed in APA 2 but operational plan will be developed in APA 3
2.2.6 Number and percent of TB reference laboratories (national and intermediate) within the country implementing a TB-specific quality improvement program i.e. Laboratory Quality Management System	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent as of September 30, 2016	6/6 (100%)	N/A	**Moderate**	National - CTRL (GLI score 3) Intermediate - Mbeya, KIDH, Dodoma, Pemba & Bugando (GLI score 3)

2.2.7 Number of GLI-approved TB microscopy network standards met	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number of standards met as of September 30, 2016	3	N/A	**Moderate**	2, 6, 8 - standards met
2.3.1 Percent of bacteriologically confirmed TB cases who are tested for drug resistance with a recorded result.	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent (new cases), include numerator/denominator	U	U	**Moderate**	This data could not dissagreggated by new and previously treated cases. Gx alert results are not differentiated by new and retreatment. Only culture and DST results can be differentiated new/retreatment. These are only about 10% of all bacteriological confirmed TB cases
Percent (previously treated cases), include numerator/denominator	U	U		
Percent (total cases), include numerator/denominator	17% (10,660/61,376)	19% (4,292/23,041)		

3.1.1. Number and percent of cases notified by setting (i.e. private sector, pharmacies, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach	**National APA2**	**CTB APA2**	**CTB APA 2 investment**	**Additional Information/Comments**
Number and percent	*Fill in data in "Ind 3.1.1 - APA 2" worksheet*	*Fill in data in "Ind 3.1.1 - APA 2" worksheet*	**Moderate**	
3.1.4. Number of RR-TB or MDR-TB cases notified	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Total 2015	272	272	**Substantial**	CTB supports all RR - TB and MDR TB country wide
Jan-Mar 2016	49	49		
Apr-June 2016	45	45		
Jul-Sept 2016	50	50		
To date in 2016	144	144		
3.2.1. Number and percent of TB cases successfully treated (all forms) by setting (i.e. private sector, pharmacies, prisons, etc.) and/or by population (i.e. gender, children, miners, urban slums, etc.).	**National 2014 cohort**	**CTB 2014 cohort**	**CTB APA 2 investment**	**Additional Information/Comments**

Number and percent of TB cases sucessfully treated in a calendar year cohort	Getting from WHO	19,736/22,063 (89%)	**None**	
3.2.4. Number of patients started on MDR-TB treatment	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Total 2015	124	124	**Substantial**	22 initiated treatment at decentralized sites ie. Kagera Regional Hospital (RH) - 2, Ukonga Dispensary - 5, Tambukareli Disp - 3, Rangi tatu hospital - 1, Sinza Hosp 8, Newala District Hospital (DH) - 1, Mbogwe DH - 1 and Bukombe - DH 1.
Jan-Mar 2016	40	40		
Apr-June 2016	40	40		
Jul-Sept 2016	44	44		
To date in 2016	124	124		
3.2.7. Number and percent of MDR-TB cases successfully treated	**National 2013 cohort**	**CTB 2013 cohort**	**CTB APA 2 investment**	**Additional Information/Comments**

Number and percent of MDR-TB cases successfully treated in a calendar year cohort	Getting from WHO	63/92 (68%)	**None**	National 2013 cohort data analysed in 2016
5.2.3. Number and % of health care workers diagnosed with TB during reporting period	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	
Number and percent reported annually	Not available	Not available	**Moderate**	Data is available for 2016 for CTB regions only
6.1.11. Number of children under the age of 5 years who initiate IPT	**National 2015**	**CTB 2015**	**CTB APA 2 investment**	
Number reported annually	160	72	**Moderate**	Source DHIS 2
7.2.3. % of activity budget covered by private sector cost share, by specific activity	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent as of September 30, 2016 (include numerator/denominator)	N/A	N/A	**None**	
8.1.3. Status of National Stop TB Partnerships	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	0	0	**Substantial**	Initial preparations for establishment of the partnership have started i.e ToR,

				checklist for potential members developed
8.1.4. % of local partners' operating budget covered by diverse non-USG funding sources	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Percent as of September 30, 2016 (include numerator/denominator)	N/A	653,500/774,000 US$ (84%) NELICO - GEITA 0/14,646$ (0%) TOKKIUKI - DAR $681/681 (100%) SANAA WALIPO - ARUSHA	**Limited**	Only 1 of the 3 local CSOs (NELICO) in Geita District engaged in APA2 gets USG funding. The other 2 operate fully on non-USG funding
8.2.1. Global Fund grant rating	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	A1	N/A	**None**	
9.1.1. Number of stock outs of anti-TB drugs, by type (first and second line) and level (ex, national, provincial, district)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**

Number as of September 30, 2016	**0**	0	**None**	
10.1.4. Status of electronic recording and reporting system	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Score as of September 30, 2016	1	N/A	**Substantial**	Electronic reporting to national level by DHIS using district level aggregated data is available. CTB is supporting development an ERR case based system to be used country wide
10.2.1. Standards and benchmarks to certify surveillance systems and vital registration for direct measurement of TB burden have been implemented	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Yes or No as of September 30, 2016	No	N/A	**None**	This was done in 2014
10.2.6. % of operations research project funding provided to local partner (provide % for each OR project)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**

Percent as of September 30, 2016 (include numerator/denominator)	N/A	0%	**None**	OR not yet funded, proposals have been submitted by university students, implementation will commence in October 2016. Activity was planned in APA 2 but implementation has been delayed to October 2016 i.e APA 3
10.2.7. Operational research findings are used to change policy or practices (ex, change guidelines or implementation approach)	**National APA 2**	**CTB APA 2**	**CTB APA 2 investment**	**Additional Information/Comments**
Yes or No as of September 30, 2016	N/A	No	**None**	Operational Research not yet conducted, will be done in APA3
11.1.3. Number of health care workers trained, by gender and technical area	**CTB APA 2**		**CTB APA 2 investment**	**Additional Information/Comments**
			Substantial	
	# trained males APA 2	**# trained females APA 2**	**Total # trained in APA 2**	**Total # planned trainees in APA 2**
1. Enabling environment	**114**	**113**	**227**	**227**

2. Comprehensive, high quality diagnostics	**40**	**10**	**50**	**50**
3. Patient-centered care and treatment	**190**	**86**	**276**	**276**
4. Targeted screening for active TB			**0**	**0**
5. Infection control			**0**	**0**
6. Management of latent TB infection			**0**	**0**
7. Political commitment and leadership			**0**	**0**
8. Comprehensive partnerships and informed community involvement			**0**	**0**
9. Drug and commodity management systems			**0**	**0**
10. Quality data, surveillance and M&E	**46**	**10**	**56**	**56**
11. Human resource development			**0**	**0**
Other (explain)			**0**	**0**
Other (explain)			**0**	**0**
Grand Total	**390**	**219**	**609**	**609**

11.1.5. % of USAID TB funding directed to local partners	National APA 2	CTB APA 2	CTB APA 2 investment	Additional Information/Comments
Percent as of September 30, 2016 (include numerator/denominator)	N/A	0.8% 21,000/2,476,625 US$	**Moderate**	Local partners have been identified (local university students for OR & CSOs for community engagement) but funds not yet disbursed. 30,000 was to be disbursed to CSOs, out of it 21,000 was used for assessment and capacity building of the CSOs. The 15,000 allocated for OR is yet to be utilized

Year/Quarter	Number of pre-/XDR-TB cases started on BDQ nationwide	Number of pre-/XDR-TB cases started on DLM nationwide	CTB APA 2 investment	Additional Information/Comments
Total 2014	0	0	**Moderate**	
Total 2015	1	0		
Jan-Mar 2016	0	0		
Apr-Jun 2016	0	0		

Jul-Aug 2016	0	0		
To date in 2016	0	0		

Number and percent of cases notified by setting (i.e. private sector, prisons, etc.) and/or population (i.e. gender, children, miners, urban slums, etc.) and/or case finding approach (CI/ACF/ICF) (3.1.1)							
		Reporting period					**CTB APA 2 investment**
		Oct-Dec 2015	Jan-Mar 2016	Apr-Jun 2016	Jul-Sept 2016	Cumulative Year 2	
Overall CTB geographic areas	TB cases (all forms) notified per CTB geographic area *(List each CTB area below - i.e. Province name)*						
	ARUSHA	847 (14%)	810(13.3%)	860 (13.5%)	913(15%)	3430	
	DAR ES SALAAM	2356 (38.8%)	2268(37.4%)	2,387 (37.5%)	2063(34%)	9074	
	GEITA	486 (8%)	578(9.5%)	580 (9.1%)	554 (9%)	2198	
	KILIMANJARO	596 (10%)	572(9.4%)	647 (10.1%)	643(10.6%)	2458	
	MWANZA	971 (16%)	1040(17%)	1,128 (17.7%)	1118(18.5%)	4257	
	PWANI	573 (9.4%)	585 (9.6%)	570 (8.9%)	590(9.7%)	2318	
	ZANZIBAR	240 (4%)	201(3%)	184 (2.8%)	155(2.5%)	780	
	TB cases (all forms) notified for all CTB areas	6,069	6,054	6,356	6036	24515	

	All TB cases (all forms) notified nationwide (denominator)	16,045	16,132	16,659	Not available		
	% of national cases notified in CTB geographic areas	38%	38%	38%	Not available		
Intervention (setting/population/approach)							
Reported by private providers (i.e. non-governmental facilities)	CTB geographic focus for this intervention						
	TB cases (all forms) notified from this intervention	1101	523	938	842	3043	
	All TB cases notified in this CTB area (denominator)	6069	6054	6,356	6063	24542	
	% of cases notified from this intervention	18%	8.6%	15%	14%	12%	
Children (0-14)	CTB geographic focus for this intervention						
	TB cases (all forms) notified from this intervention	567	686	727	589	2569	
	All TB cases notified in this CTB area (denominator)	6069	6054	6,356	6063	24542	
	% of cases notified from this intervention	9.3%	11.3%	11.4%	10%	10%	
Intensified case finding (ICF) (e.g. health facility-based case finding)	CTB geographic focus for this intervention					0	
	TB cases (all forms) notified from this intervention	1210	1212	1,433	1457	5312	
	All TB cases notified in this CTB area (denominator)	6069	5931	6,356	6063	24542	
	% of cases notified from this intervention	20%	20%	22.5%	24%	22%	

Annex II: Status of EMMP activities

Year 2 Mitigation Measures	Status of Mitigation Measures	Outstanding issues to address in Year 3	Additional Remarks
CTB successful procured 4 GeneXpert machines and Xpert Cartridges in Year 2 implementation. It was not involved procurement and distribution of any pharmaceutical drugs and medical supplies. Possible threats: If not distributed and disposed properly, these supplies may contribute to solid waste.	CTB ensured proper procurement of these items, which were delivered directly to the identified health facilities in Tanzania. Although the responsibility for storage and distribution to the facility level lie with NTLP, CTB advised the NTLP on the proper storage based on the information provided on the manufacturers materials safety data sheet. CTB also advised NTLP to follow the guidelines provided in the *Guidelines for Small-Scale Activities in Africa* for proper packaging and disposal of all public health commodities other than pharmaceutical drugs. CTB project provided necessary precautions on environmental impacts through the technical assistance provided (training, on-site technical assistance and on-the-job training and monitoring) to support proper storage, distribution, and	CTB will continue to ensure proper procurement of GeneXpert machines and will support NTLP on the proper storage based on the information provided on the manufacturers materials safety data sheet. CTB will also continue to advise NTLP to follow the guidelines provided in the *Guidelines for Small-Scale Activities in Africa* for proper packaging and disposal of all public health commodities other than pharmaceutical drugs. CTB project will continue to provide necessary precautions on environmental impacts through the technical assistance provided (training, on-site technical assistance and on-the-job training and monitoring) to	

	handling of Gene Xpert cartridges.	support proper storage, distribution, and handling of Gene Xpert cartridges.	
Activity CTB supported Central TB Reference Laboratory (CTRL) and other selected health facilities in the expansion of GeneXpert, a sputum transportation system, microscopy services, EQA, use of pediatric gastric probes, use of biosafety cabinets and HEPA filters, drug resistance survey. **Possible threats:** Gene Xpert testing supported through Challenge TB project, will produce used cartridges contributing to medical waste, waste generated from sputum, lab reagent and used HEPA filters; Improper handling, storage and disposal of all these may result in transmission of disease-causing pathogens through infectious waste if waste is not treated in a way that destroys pathogenic organisms.	For health facilities being supported by CTB, the project facilitated the awareness of the country's non-medical and medical waste management regulations and procedures. CTB supported training in clinical waste management and ensure that it is integrated into training programs and NTLP guidelines. Training materials aligned with Environmental Guidelines for Small-Scale Activities in Africa. During supportive supervision visits, management and disposal of medical waste were discussed and checked; necessary corrections were made. The *Healthcare Waste Management Minimum Program Checklist and Action Plan* were completed by all health facilities being supported by Challenge TB. Responsible staff were trained on how to use this tool to	CTB Project will continue to facilitate the awareness of the country's non-medical and medical waste management regulations and procedures. CTB will support training in clinical waste management. During supportive supervision visits, management and disposal of medical waste will be discussed and checked; necessary corrections will be made. The *Healthcare Waste Management Minimum Program Checklist and Action Plan* will be completed by all health facilities being supported by Challenge TB.	

	assess the status of and improve waste management practices.		
Activity: The project conducted minor renovations of the Central TB Reference Laboratory (CTRL) as one of the process to qualify for accreditation **Possible threats:** Improper disposal or handling of toxic materials used in renovations (e.g. solvents, vehicle maintenance fluids, use of toxic lead paint) may result in contaminated ground or water supplies. The aesthetics of the site may be damaged (i.e. indigenous trees harmed or destroyed, vegetation destroyed, soil eroded).	CTB ensured the activity was completed in a manner consistent with the good design and implementation practices described in Environmental Guidelines for Small-Scale Activities in Africa. No lead paint was used and excess materials were disposed in an environmentally sound manner. CTRL was equipped with a negative pressure rooms to mitigate the risk of cross contamination or occupational health-related TB infection.	CTB will conduct phase two minor renovation at CTRL in a manner consistent with the good design and implementation practices described in Environmental Guidelines for Small-Scale Activities in Africa. No lead paint will be used and excess materials will be recycled or disposed of in an environmentally sound manner.	